# COMPUTERWORLD

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## Maintenance, Support Included

# Univac Buys RCA DP Commitments, Lease Base

By Edward J. Bride
Of the CW Staff

NEW YORK – Less than 24 hours after Sperry Rand announced its Univac Division would buy the RCA customer base, Univac officials requested an immediate conference with the RCA Computer Users' Association (CUA).

David Rau, CUA president, read about the Nov. 19 agreement in the next day's morning newspaper. A few hours later, Univac officials telephoned, inviting him to an all-day Monday meeting with President G.G. Probst and other Univac officials to iron out user problems and to emphasize Univac's commitment to a smooth transition, Rau said.

Rau was "impressed" after the Nov. 22 meeting, especially with Univac's willingness to work with the user group. The company is "dedicated" to winning RCA customers, he observed.

Rau has called a CUA executive meeting today (Wednesday), and Univac will participate, he added.

The original announcement, made jointly by Sperry Rand and RCA, said Univac might hire as many as 2,500 of the 6,500 remaining employees of RCA.

Last week, Univac was already interviewing marketing and customer support personnel.

Mohawk Data Sciences was reportedly waiting in the wings, just in case this deal falls through.

Late information revealed no success in RCA's attempts to sell its Marlboro, Mass., and West Palm Beach, Fla., manufacturing plants.

### No Hurdles

Robert E. McDonald, executive vice-president at Sperry Rand, saw no "significant" hurdles to the Jan. 1, 1972, completion of the deal.

The two companies gave themselves until Dec. 17 to iron out the details of the purchase, which will include some RCA test and checkout facilities.

Cash payment on Jan. 2 will be $70 million, and additional payments based on a "varying percentage of future revenues" will be made over the next five years.

The additional payments to RCA are expected to be in the area of $30 million to $60 million.

Univac verified Rau's thoughts that current contracts would be honored, and would not be renegotiated.

### Conversions . . . IBM, Too

Previous RCA commitments to guarantee conversion from IBM to RCA hardware will also be honored, according to McDonald.

IBM users in the throes of such a conversion are still restricted by any monetary limitations imposed by original RCA contracts.

Univac will extend its commitment to the degree of RCA's commitment, McDonald stated.

McDonald, former president of Univac, also predicted RCA systems would be useful and usable "certainly through 1974" and likely through 1976. He said RCA would maintain a spare parts inventory, and he foresaw no problems in the memory expansion or peripheral equipment areas.

RCA is still supplying equipment overseas to Siemens, an official noted, although the supplying is being done from inventory.

### Customer Loyalty

Last spring, there was only one computer company with a worse "customer loyalty" record than RCA, and that company was Univac, according to a market

*(Continued on Page 2)*

# Program Jinx Delays Vote In Cincinnati

CINCINNATI, Ohio – The November election results were delayed five days because of programming problems here, and a human observer, not a built-in audit check, averted a situation which could have been even worse.

In the middle of the Cincinnati controversy over paper ballots, new criticism was aired on the punch-card system of computerized voting, as exemplified in last year's Detroit mishaps.

Hamilton County here does not use punch cards, however. The voters use paper ballots read by a Coleman optical scanner, which is on-line to an RCA Spectra 70 at a regional DP center.

When the computer returned obviously erroneous results to a printer in the registration office here, observers knew something was wrong.

The election board ordered a halt to the count when about 700 of the 1,159 precincts had been counted. Claude Hill, supervisor of registration, told CW the Coleman scanner had been programmed erroneously, and was not properly accounting for the rotation of candidates, which is required by law here.

An observer expected one precinct to vote heavily for one political party, Hill related, and when the vote went "strongly" in the other direction, the observers became suspicious.

Normally, built-in software checks would have detected this fault before the election was even conducted, but late ballot changes caused by some court challenges prevented officials from running the audit checks, he said.

Reprogramming the scanner simply meant re-cutting a paper

*(Continued on Page 2)*

## 'Dial-a-Word'

**Participating in Bell Labs experimental project at the Mechanic St. School in Red Bank, N.J., Janet Crotchfelt, a primary grade student, uses a Touch Tone telephone to call a computer for help with her reading lesson. Temporarily a teacher is pronouncing the requested words, but the plan eventually calls for a voice response unit. The new project, called "Operation Bookstrap," may one day help elementary school children improve their reading skills.**

# Social Workers Fight Suspension For Not Providing Data for Bank

By Edward J. Bride
Of the CW Staff

SAN FRANCISCO – The legality of data banking personal information is at issue here, in a case involving two social workers who refused to give their files to the state for computer entry.

The workers, Josephine Belmont and Glenda Pawsey, were suspended without pay for five days, and have filed suit against the California State Department of Social Welfare.

While they are only seeking their back pay, their American Civil Liberties Union (ACLU) attorneys say a larger issue exists: the requirement to divulge the "most private data" on welfare clients for computer entry, when privacy safeguards are inadequate.

One ACLU attorney noted California law permits state employees to disobey an unlawful order, and the ACLU will attempt to prove that the collection and data banking of private data is illegal, he said.

The suit was filed in Superior Court here Nov. 15. The state has 30 days in which to reply.

The social workers refused to divulge information on such items as alcholism, sex offenses, or mental illnesses, local sources reported.

While the state personnel board ruled the pair had violated an explicit Welfare Department order, the suit will attempt to prove the order was not a lawful one, an ACLU official explained.

While such information may be necessary for a social worker to handle case work properly, the alleged inadequate safeguards make procedures "every bit as shocking as the massive bed checks which the courts struck down a few years ago," attorney Charles Marson said.

The comment refers to a plan by a California county to conduct a door-to-door "inspection" of potential violators of the man-in-the-house rule, a state official told CW. Such violators could be denied welfare payments, he added.

While the current controversy has not caused any drastic changes in the welfare data bank, the official stated, it has

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## On the Inside


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# GE Offers R&D Crew Plum to Break Access Codes

By E. Drake Lundell Jr.
Of the CW Staff

SCHENECTADY, N.Y. – GE's Research and Development Center here stands to make money every time its employees steal secrets from another part of the company.

The Information Services Department of the huge manufacturer will pay the Research and Development Center $5,000 each time one of its employees is able to access unauthorized parts of the firm's nationwide time-sharing network.

The offer to the Research and Development Center also is good for employees of the Corporate Engineering and Services Group and is just part of an overall program to make sure the system is secure, according to George J. Feeney, general manager of the Information Services Department.

The Information Services Department wants to find any potential chinks in its security armor in order to fill them before outsiders such as industrial spies are able to use them.

Operating a time-sharing network requires a firm to be extremely security conscious, Feeney said, since it would be disastrous if a firm could gain access to a rival company's data base stored in the system.

GE feels that the system is secure because the protection features of the system are built into the hardware, Feeney said.

"I don't think there is any way to protect a system through software alone," Feeney said. The GE system, he added, employs a hardware memory protect feature rather than software to keep the system secure.

In addition to encouraging other segments of the firm to try to find loopholes in the system, the Information Services Department also has contracted with Computer Audit Inc. to conduct site audits and to try to gain unauthorized access.

Computer Audit has assigned two executives to masquerade as customers to get terminals installed. These experts, who have been able to break into two other systems, have not yet penetrated the GE system in nine months of trying.

# Program Jinx Delays Vote in Cincinnati

*(Continued from Page 1)*

tape to account for the proper ballot positions, and by the time that was realized and completed, it was five days later.

The final count took about five hours on the Spectra, Hill noted, which is about normal.

Under normal procedures, election workers open ballot boxes and place the bulky paper ballots on "spindle boards," he explained. Past delays in this system have been caused by "crooked" positioning of ballots.

In some cases, he continued, workers even cut new holes in the paper ballots, so they could be placed upside down on the spindle board.

Local sources reported delays in every election since the scanning system was introduced in 1964, but Hill said most of the delays were caused by people, and not equipment.

The improper handling of the paper ballots is one instance where the machine took the blame for a "people problem," he noted.

These last two aspects of computerized voting – the people and the media – drew new criticism from one of the investigators of the 1970 Detroit debacle.

Henry R. Grysh, vice-chairman of the Detroit chapter of the Association for Computing Machinery, was especially critical of pre-scored punch cards as an input media. "A ballot made out of pre-scored cards is just indefensible as a document for voting purposes," Grysh stated, "regardless of the thickness involved or construction of the ballot itself."

The fact that the ballot is pre-scored leaves it "wide open to all kinds of abuse," including mishandling, he noted.

### Duplication Criticized

The procedure for duplicating ballots with hanging chad was also scrutinized by the ACM official. Citing Oregon regulations as one example, Grysh explained that pre-scored ballot cards are placed under questioned or imperfect ballots, in the voting device.

Members of duplicating teams then sight along the cards, punching through all holes and those with hanging chad (one or two corners still connected). After reproduction, the ballots are presented to other members of the team for verification.

The fact that the checking is done after reproduction, and that the punching takes place "through both documents," leaves this procedure replete with "obvious flaws," he claimed.

He also called on his experience in compiling the Detroit report to explain one aspect of the personnel problem. In this instance, Detroit's duplicating teams were reproducing damaged ballots.

"The first woman missed calling five punches from the original," Grysh related, "and called one extra punch. The second woman matched the two cards for verification but missed noting the extra punch," he continued.

A third party arrived to verify the two cards, and detected the extra punch. This, he said, required repeating the process.

"On the second time around, the caller missed one punch again, but the puncher detected this in verification."

# Univac Buys RCA DP Commitments, Base

*(Continued from Page 1)*

study by International Data Corp.

McDonald said three factors could mollify this phenomenon:

- If RCA users felt "abandoned," they now could look to a company which saved them, thereby reducing any feelings of alienation
- Univac's loss of customers who upgraded may be reduced now that new systems, particularly the 1110 and 9700, have been introduced to fill hardware gaps
- During the last two years, Univac has placed increasing emphasis on better service and customer satisfaction. Univac is "accelerating our efforts" in this area, he added.

Unlike Univac, RCA has not been profitable in the computer business, although Univac expects the "new" users to generate a profit next year. The RCA losses were largely the result of research and development, officials noted, and these expenditures will not be duplicated.

Regarding RCA-Univac equipment conversions, McDonald said there is no pressure on RCA users to change their hardware. Admitting any conversion could bring problems, McDonald emphasized the "time pressure" is now gone, mollifying the overall problem.

Since users are assured of maintenance and service, they can upgrade according to their own time frames, he noted.

RCA engineers hired by Univac will now undergo training in both lines, as will current Univac personnel, McDonald said.

In a separate interview, Wayne Wells, executive vice-president of Mohawk, said the company is not interested in the West Palm Beach – or the Marlboro – facility "without the customer base."

He declined comment on why the Mohawk offer, reportedly $10 million higher than Univac's, was not accepted by RCA, although two reasons were generally consistent among industry sources:

- Univac had "ready cash," and did not have to arrange financing
- Univac is well-established in the mainframe field, with a support base and manufacturing plants.

The Mohawk offer is still effective, Wells added, since there was "no reason to withdraw it." Even so, he does not foresee a stumbling block to the Univac-RCA deal.

The RCA user who had filed a $110 million lawsuit against the company for the alleged loss in value of installed systems, Marketime Corp., said it was "premature" to discern whether the acquisition would change its legal plans.

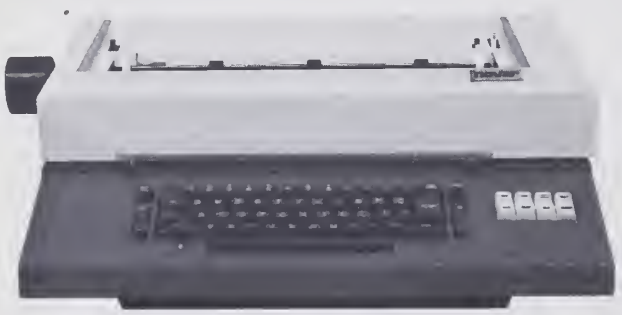
A spokesman said "nothing has been affirmed" from the user point of view, as far as Marketime was concerned.

About 1,000 RCA computers are involved in the transaction; they are installed at about 500 sites in the U.S., Canada, and Mexico. Total value of the RCA systems is estimated at $1 billion, while Univac's installed base is about $3.2 billion.

It is expected that this deal will make the new Univac computer business bigger, in both value and systems installed, than the combined GE-Honeywell business.

The acquisition thus fulfills an old RCA dream of becoming "number two" in the computer field, although it's a back-door fulfillment . . . becoming "part of the "new Number 2."

Univac additionally will broaden its market share in the state and local government area, plus manufacturing and education, formerly RCA's strongest areas.

The new Novar 5-40 MOD I is designed for use with in-house data collection and entry systems presently served by the 2740 Model 1. There are differences however—the Novar unit is smaller, lighter and self-contained, sells for $3500, rents for $95 per month.

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## 200 Inquiries a Day

# OEP Price Freeze Computer Up in Four Days

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – It was one emergency that had not been prepared for.

President Nixon's August 15 televised announcement of the price and wage freeze caught the Office of Emergency Preparedness – the agency the President assigned to monitor the freeze – as unprepared as the rest of the nation, but it was faced with the task of monitoring the nation's myriad business for compliance with the order.

Within four "long" days, however, OEP had a computer system on the air supplying administrative data to headquarters staff. Within three weeks it was keeping the OEP regional offices up to date on the latest decisions of the Cost of Living Council, which set policy for the freeze period.

### 2,500 Lines

Dr. Murray Turoff of the OEP wrote over 2,500 lines of XBasic programming to get the initial system on the air. Since then the staff of OEP working on the system has expanded to 5 programmers and the system has grown to more than 10,000 lines of XBasic.

OEP associate director Robert Kupperman said that the OEP could have performed its role as freeze monitor without the system, but it had "aided" the agency greatly in the performance of its assigned duties.

In addition, he said the system has allowed the agency to perform smoothly during the crisis and allowed it to allocate its resources in a more effective manner than would have been possible otherwise.

The system now in use is called Emisari (Emergency Management Information System and Reference Index) and is based on a Univac 1108 located "in a classified location," according to Dr. Turoff.

It is connected to terminals in all of the 12 OEP regional offices and to at least 15 terminals located in the headquarters of the agency here.

### 200 Calls a Day

During the three months of Phase I of the freeze, the system handled over 200 calls a day and 30,000 items were pulled out of the system in one three week period alone.

Basically, the system kept the headquarters staff informed of all of the activity in the regional offices, such as complaints received, the number of complaints currently active, complaints that have been answered or resolved, the number of potential court cases, and the number of recommended court cases.

With this information, headquarters could keep track of how well each region was handling its work load and where additional personnel or equipment was needed.

On the other side, the system kept files on all of the decisions that had been made so that any region with a complaint or problem would be able to know immediately if any new complaint fell into a category that had already been resolved.

A separate, companion system kept track of trends in complaints and inquiries. If there was a heavy volume of complaints involving computer companies, for example, the system would alert the OEP staff to the fact that a decision was needed in this area.

### Departure from Convention

The Emisari system "represents a major departure from conventional management information system design," Turoff said.

Emisari, he said, is not oriented toward data per se, but rather toward activities of people who gather, process and retrieve the data. It not only provides for reporting up the chain of command, but also for the dissemination of policy guidance and reference material down the chain and for lateral communication among all users, he added.

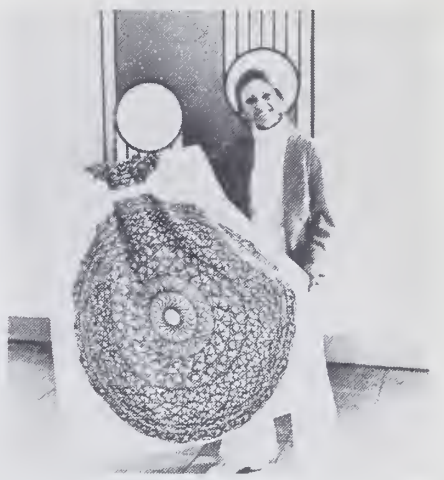
One feature along these lines was a party line that allowed individual users to call up to 12 other users within the system to exchange information on the handling of particular complaints.

The computer acted to organize, selectively sort, and store and forward a constant flow of statistics, messages, estimates, reference materials, guidelines, notices and other information needed by the users, Turoff said.

Now that Phase I of the freeze is over, so is the role of OEP, which now hopes to use the system to help manage its other programs in the areas of natural disaster relief and other possible emergencies.

### Internal Revenue Service

Even though OEP is out of business, Emisari is still monitoring business activity for violations of the new Phase II guidelines. The system has been turned over to the Internal Revenue Service, which hopes to expand the system even further to aid its monitoring function in Phase II.



## Computer Cloth

**A firm in Essen, Germany, recently bought a series of drawings that had been programmed in America. The computer art was then used as the basis for colorful material and curtain designs, which are now being shown at the Folkwang Museum in Essen.**

## Brush Clearing Made Easy

LUBBOCK, Texas – Ranchers no longer have to rely on intuition to decide which land should be cleared of brush.

A computer technique developed by Dr. Rex P. Kennedy of Texas Technical College indicates not only what part of a rancher's land should be cleared, but also the type of control that will net the most profit.

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## Programs a Culprit

# Computer Results Questioned

WASHINGTON, D.C. – In some cases it "is an unwarranted assumption" to believe that the "numerical results produced by computers are accurate, "even if the input is accurate," according to Dr. Ruth Davis, director of the Center for Computer Sciences and Technology at the National Bureau of Standards.

In a letter to Rep. Richard T. Hanna (D-Calif.), Davis noted as an example that "recent validation tests of 27 computer programs for calculating least square representations of data showed that many of those programs gave poor results, some totally unacceptable.

"The major concern here is that important policy decisions may be made on the basis of computer-produced data which are invalid because of inaccuracy in the input data or in the computer software or both," she added.

In requesting information on computer systems from Davis, Hanna stated there is a "gap between the potential of computer hardware and the level of utilization of that hardware.

"I believe that this gap, Hanna said, "is due to the fact that we have two kinds of specialists (computer technicians and problems area subject matter specialists) who often are unable to communicate effectively with each other.

"The failure to interface computer expertise and social problems leads to underutilization of computers."

In reply Davis noted, "The quality of computer services is directly dependent upon the completeness, accuracy, and timeliness of inputs available to the computer system.

"Conversely," she added, "if the handling of information being supplied for processing by a computer system is poorly done, then the computer services being provided will not be satisfactory to customers."

Most often problems with such computerized systems as credit billing and accounting result from incorrect input prepared manually for computer processing, Davis said.

But in some cases, as in the above example, the software designed for the systems is itself inadequate and leads to errors in the system, she charged.

In another area, "the services provided by the computer system are affected by the quality of performance of all the other organizational elements on which it depends," she noted.

"As a result, the actual value of a computer to a customer will be less than its realizable value when the computer is inserted into an organization of low quality performance.

"Similiarly, the acquisition of a computer will not, per se, improve the quality of the services provided," she added.

Unfortunately, Davis said, there are many examples of organizations planning the acquisition of a computer with high expectations of success in solving specific problems only to find later that the problems "not only were not solved but, indeed worsened by the computer."

For example, she noted that many local governments "are finding that the acquisition of computers on an uncoordinated, departmental basis has not really solved their problems: instead the computer system makes more untenable problems in compatibility and information transferability between existing department systems.

"Frequently," Davis added, "this failure is due to narrow and inaccurate analyses of a single department's functions without regard to the interactions with other departments or without any serious attempt to streamline functions to create a quality environment in which the computer can function effectively."

"As a result, systems conflict with each other, create chaos in providing services, and drive operating costs upward," she said.

Because of these problems and the high cost of operating computer systems, Davis said local governments are being forced to "reappraise their computer utilization and perform comprehensive systems analyses across the whole spectrum of governmental functions in order to develop applications which are of sufficient quality and effectiveness to warrant the costs of implementation and operation."

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# Social Workers Suspended

*(Continued from Page 1)*

caused the department to take a closer look at the rights of individuals, and changes could take place.

One recommendation to the department was to make the unauthorized disclosure of client information a felony, instead of a misdemeanor. The recommendation was made by an "ad hoc" committee which included social workers, but it is not expected to become law, the official stated.

### Combine Data?

One prime concern of the workers, Marsen said, was the planned combination of personal data with data from other agencies, for private and public research. Another ACLU attorney said the files of private data were maintained with client identification, so that researchers could retrieve names, as well as traits, of welfare recipients.

The plaintiffs refused to divulge the private information because they themselves could have been sued for invasion of privacy, the attorney said.

Another of the committee's consideration's was a recommendation to disassociate identifiers such as Social Security numbers or names and addresses from the personal information.

Welfare officials said this recommendation was never made, since a combined record is needed to administer welfare cases.

The social workers were suspended in May, 1969, and spent several months appealing the disciplinary action – and its notation on their employment records – through the state personnel board. A hearing officer upheld the discipline about a year ago, a state official related.

The two had a year to appeal through the courts, which they did in November, with the aid of ACLU. Besides their back pay, they want their records purged of the disciplinary action.

Sources indicate the outcome may well provide a "landmark" decision on whether the government can collect and/or computerize private data on citizens without guaranteeing confidentiality.

## DP Presidents to Gather

HOLLYWOOD BEACH, Fla. – Next week's International Business Forms Industries (IBFI) computer user's conference here will feature as speakers industry presidents Z.V. Zakarian, Western Union Data Services Co.; Charles P. Lecht, Advanced Computer Techniques Corp.; Dr. Edward Bennett, First Lexington Corp. and founder of the foundering Viatron Computer Systems Corp.; and Cullinane Corp.'s John Albert Bieser.

"Maximizing the DP investment" is the theme of the three-day forum, Dec. 6-8, at the Diplomat Hotel here. Information from IBFI at 1730 N. Lynn St., Arlington, Va., 22209.

# News Wrapup

## FJCC Attendance Below 16,000

MONTVALE, N.J. – Final attendance figures for the Fall Joint Computer Conference in Las Vegas will fall below the 16,000 level, according to the American Federation of Information Processing Societies (Afips), here.

Earlier totals of 17,000 [CW, Nov. 24] were projections based on the first two days' attendance. The latest figure is 15,745, with over 9,000 of that total coming from exhibitors or their guests.

Paid attendance was 3,217 for the conference sessions – up from last spring's 3,159. Students, military, and exhibit-only fees brought the total paid attendance to just under 5,500, Afips noted.

## Group Takes 'Credit' for Honeywell Bomb

BOSTON – A revolutionary group has taken responsibility for the recent explosion, apparently caused by a pipe bomb, at the Honeywell complex in nearby Wellesley. Damage was limited to glass breakage in a stairwell.

In a "communique" sent to a local radio station the day after the bombing, the Comrades in Arms said they took the action "as a response to Honeywell's role as a major defense department armament contractor."

The note said the group chose to attack Honeywell to remind people that "now, this minute," Honeywell armaments are killing people "throughout Asia." They called on "our brothers and sisters" to join them in a "winter offensive" against the "Nixon-Mitchell-Hoover murder machine."

## Treasurer Fights Proposed Computerization

HANOVER, Pa. – Carroll County Treasurer Charles J. Simpson doesn't want to set up a computer program for his office. Simpson is contesting a directive from the county commissioners ordering his department to join other departments in common use of computerized accounting. The order stems from a governmental reorganization that will abolish the office of county treasurer at the end of Simpson's term, in December, 1974.

Simpson claims there hasn't been adequate planning and preparation for the changeover, nor sufficient training of personnel. "[Our people] had only one meeting with the county's programmer before the directive to computerize came," Simpson said.

His department now has to do twice as much work as it had to before the directive, he noted. "We still have to keep all our books manually, as well as prepare some items for computer entry," he said.

## 'Big CIS' to Reduce Burglaries

DALLAS – Drastic reduction of burglaries is the object of "Big CIS," a computer identification system being implemented by the police department here.

Citizens etch their driver's license numbers on all valuable property with an electric pencil, and then register their names and license numbers with the police computer. When stolen merchandise is recovered, the police can identify the owner within minutes if he is registered with "Big CIS."

A similar program in Monterey, Calif., showed only three burglaries in 4,000 registered homes, while 1,800 burglaries took place in 7,000 unregistered houses.

## Europe's DP Employment Prospects Bleak

LONDON – The outlook for technical and professional executives in Europe looks very bleak, according to a survey just published here by PA Management Consultants. Overall demand for executives in western Europe slumped by 46%. In the UK the drop in demand was 54% and in Belgium 58%.

In the technical and professional category the drop was particularly steep, amounting in the quarter from July to September to over 62%. For computer men in particular demand declined 53%.

## Square Root of 2 Computed in 47 Hours

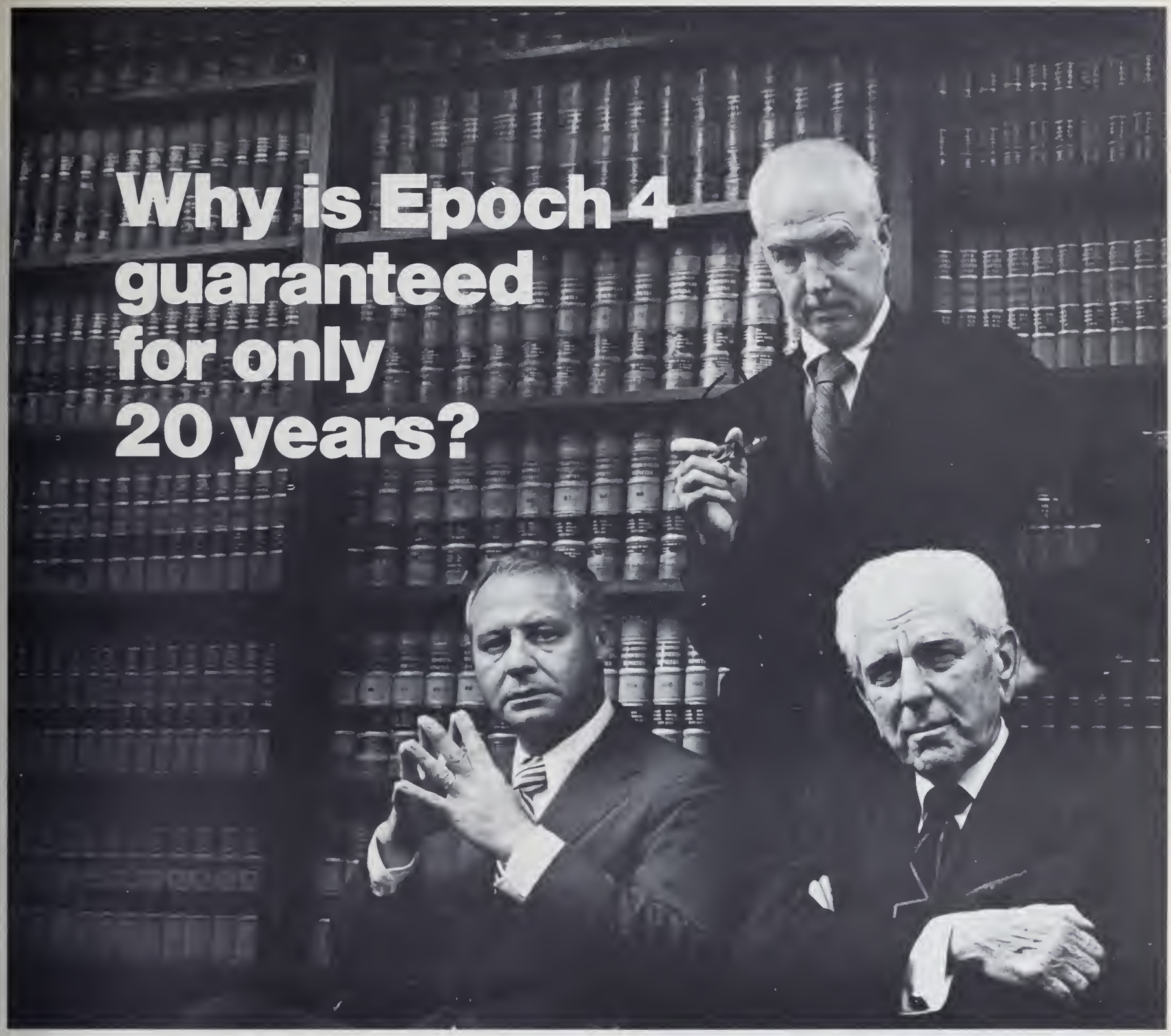
NEW YORK – The square root of two to a million places – it's been calculated by Dr. Jacques Dutka of Columbia University. The 200 pages of printout obtained after 47.5 hours of computer time contained 5,000 digits apiece. There is significance to this exercise – perhaps the most exact calculation of an irrational number ever – beyond academic curiosity, Dutka contends.

Since the digits of the solution are effectively random, they may be better suited to mathematical applications calling for random inputs than tables of artificially generated random numbers which could contain subtle biases. Meanwhile, Dutka is working on similar calculations for $\Pi$ and $e$.

## Computerized Bus Route Safer, Cheaper

ORANGE, Ohio – Computer scheduling of bus routes has enabled the public school system here to lower transportation operating costs 15% and increase safety, according to school officials. The 25 square mile school district is primarily rural, with narrow roads, cul de sacs, large frontage lots, and unevenly distributed population. Most of the 2,800 students are bused to school.

Transportation costs were therefore high, and routing a critical factor in operating efficiency. Environmental Economics Inc. of South Euclid, Ohio, took over the scheduling problem, and using a computer, developed routes that almost eliminated walking by students and didn't require any children to cross streets to get to a bus stop. The schedule also saved the schools $40,000 a year.

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# Airline Schedulers Get Planning Assist From DP Link at International Meeting

By Joseph Hanlon
Special to Computerworld

GENEVA – Computers are being used increasingly as planning aids, but if the planner must modify his plan quickly far from the computer center, he often cannot use this tool just when he needs it most.

British European Airways (BEA) schedulers solved this problem at the recent International Timetables Meeting here by installing a terminal linked to the airline's computer in London.

All input was via the remote terminal, and urgent queries with relatively simple answers were handled in real time. But to save money, processing with long printouts was done in batch mode and shipped overnight airfreight rather than transmitted over the data link.

The timetables meeting is held every two years for the world's airlines to coordinate their schedules and prevent such difficulties as dozens of planes trying to land at the same airport at the same time.

Months of careful planning and schedule building precede this conference, but the final coordination is done in one week of hectic horse trading.

Once a change is agreed to, it is virtually impossible to amend; a miscalculation at this meeting could mean overtime charges for flight crews or chronically late planes for the next two years.

An airline scheduler faces three problems:

- Are there enough planes available and are they used efficiently?
- Is there enough turnaround time at the end of each flight so that if a plane is slightly delayed it will not be late for its next flight (a serious problem for a short haul airline such as BEA, where one plane may make up to 16 flights per day)?
- Is there enough maintenance equipment and crew available to service the planes efficiently?

BEA has not yet reached the stage of preparing schedules by computer, but it has developed software to check manually prepared schedules in each of these three areas. A simulation, for example, looks at turnaround time and other factors to predict punctuality.

BEA schedulers made roughly 100 timetable changes during the meeting, according to Terence Butfield, BEA's principal operations research officer. After each set of changes was negotiated, the schedulers input the revisions into the Geneva terminal.

The London computer did a format check, considered plane availability, ran the punctuality simulation, and reported back immediately.

If the initial results were acceptable, the more complex maintenance study was done in batch mode during the night. The results of this study, plus an entire revised schedule, were printed out and put on the first plane to Geneva the next morning, arriving before meetings began that day.

The schedulers did not formally agree to the negotiated changes until the results of all computer checks were available. When the checks showed that proposed changes were unworkable, the schedulers were able to go back and renegotiate.

Previously, all checks had to be worked out by the scheduler. "Sometimes what you can't work out in your head can clobber you," Butfield commented.

# FBI Urges NCIC Links To Add Missing Data

WASHINGTON, D.C. – The FBI is apparently having follow-up problems with its well-established, computerized National Crime Information Center (NCIC).

A newsletter to system users cautions that some entry information is being "overlooked" or "follow-up action is not being taken to acquire and enter this searchable data."

Fields for license or registration data on stolen cars, or vehicle identification numbers are affected, the newsletter says.

A recent review of the vehicle file at NCIC disclosed the fields which, the FBI noted, were being left blank because in some situations the data was not available.

Lack of this information initially "should not preclude the immediate entry of a record," the FBI told NCIC users, but "follow-up action should be taken" to insure subsequent inclusion in the computerized files.

Wanted person records are not complete, either, the FBI said, with some lacking "valuable searchable information" such as social security number, driver's license number, etc.

"These numbers are important and should be included in the record as soon as possible" following initial entry, the newsletter continued.

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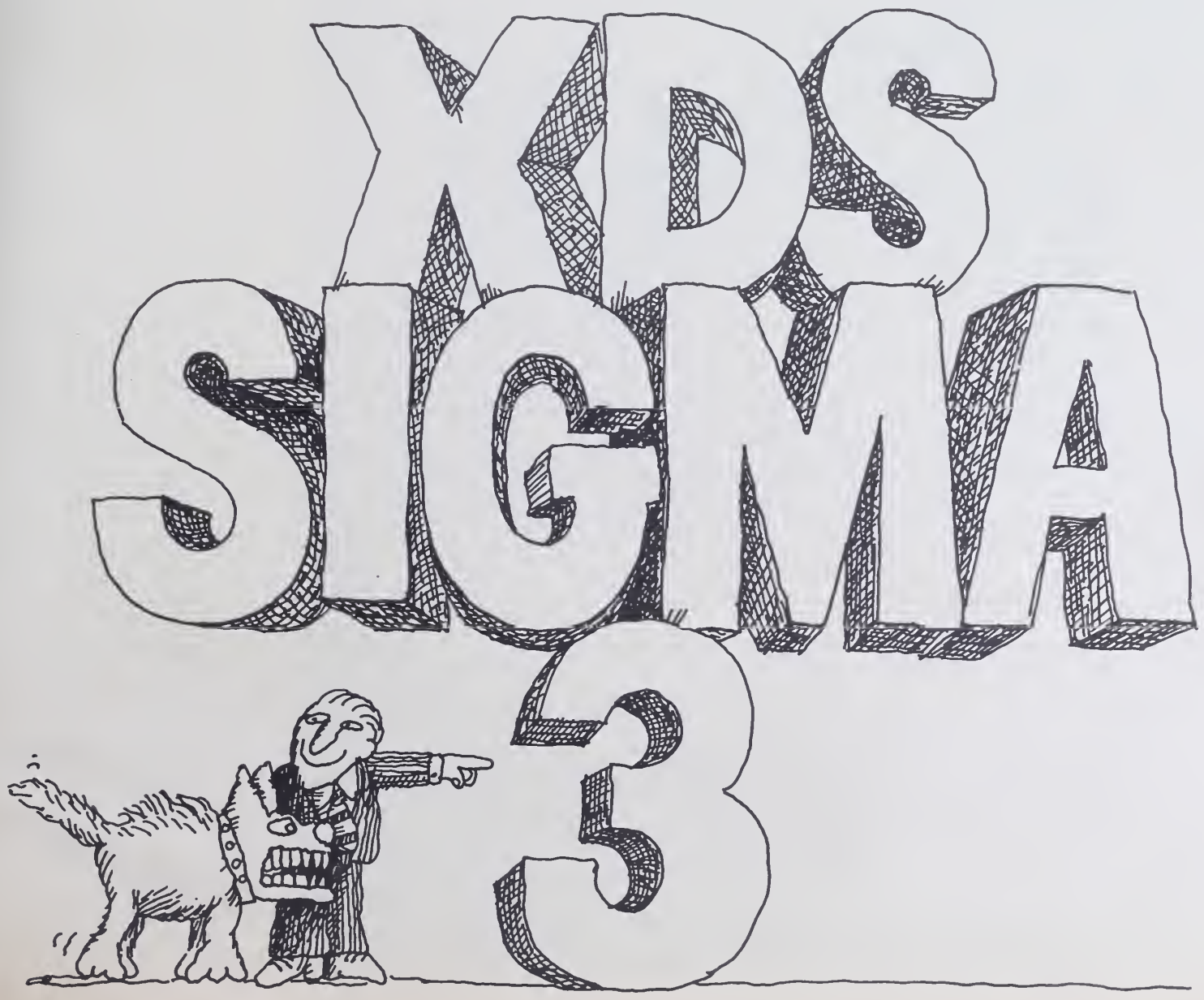

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# Univac 418 III Accesses Data Stored In 370/155 via User-Designed Coupler

AKRON, Ohio – The B.F. Goodrich Co. has hooked together an IBM and a Univac computer with an "inter-computer coupler" (ICC) of its own design to create what it claims is a unique DP system.

The combination not only replaces four older computers, but also operates much faster at about 30% less cost and can expand its work load, according to Arthur Williams, director of information systems at B.F. Goodrich (BFG).

The first major application of the system is operation of the customer order and inventory control systems for three of BFG's largest divisions.

The firm plans to directly tie in its chemical division computer center in Independence, Ohio, with the corporate data center in Akron later this year, he stated.

Univac 418 III, rear, polls the IBM 370/155, the central storage system in B.F. Goodrich's Akron data center.

Key units in the system are an IBM 370/155 and a Univac 418 III. The Akron-built coupler sets up a direct channel for instant input and retrieval of data from the Univac to the IBM 370, the central storage system, Williams explained.

The Univac 418 III controls the firm's administrative communications network and taps the 370 for needed information. About 125 locations and 13,000 miles of telegraph wire are interconnected.

### Eliminated Overhead

"With the 155, we have integrated systems that previously ran on three separate computers and eliminated overhead in triplicate," Williams said. "The speed of the 370 is so much greater that we need at least the same staff as before to handle the flow of information."

The 155 currently has about the same work capacity as the old units, but can be expanded to twice that, a move likely to occur next year, he added.

It processes data for various functions such as production planning, retail store management and control, market planning, billing, design of tires, airplane brakes, conveyor belts and preparing tapes for numerical control machines on the production line.

The IBM unit also is available on a time-sharing basis through a hookup with remote consoles in various geographical locations. Centrally stored information can be called up by these remote stations utilizing individual computer programs.

Through the hookup with the 155, the Univac can ask for additional random information stored in the central computer, whenever it needs it.

The combination of computers operates several divisions' inventory control programs that involve processing customer order entries, allocating inventory, creating the shipping documents and transmitting these documents to warehouse and shipping points.

The Univac will call on the IBM only for specific information needed in inventory control. It does not store operating data itself. This system is the most cost-effective system now available for this job, Williams said.

BFG is planning to make the coupler and related software available in the near future. Other programs utilizing the unique computer combination are anticipated, Williams said.

## Bank Computer Turns Teacher

LONDON – An IBM 1460, for six years used as the control computer in Lloyds Bank's branch computer accounting network, has been donated by the bank to Imperial College.

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## Users' Budgets Surveyed

# Salaries Rise, Hardware Falls

By a CW Staff Writer

NEWTON, Mass. – Many users' hardware budgets have been slashed in recent years, because of increasing personnel and training expenditures, according to a *Computerworld* survey.

Over three-fourths of the users surveyed said they had experienced increases in their personnel budgets for each of the last two years, while hardware budget cuts have quadrupled in the past three years.

The effects of IBM's unbundling and the recessionary economy are clear in the budget portion of the study: 49% of the users had hardware budget increases in 1969, before implementation of unbundling, but the total jumped to 59% in 1970. As the recession became more severe, however, the budget increases dropped back to 53% this year.

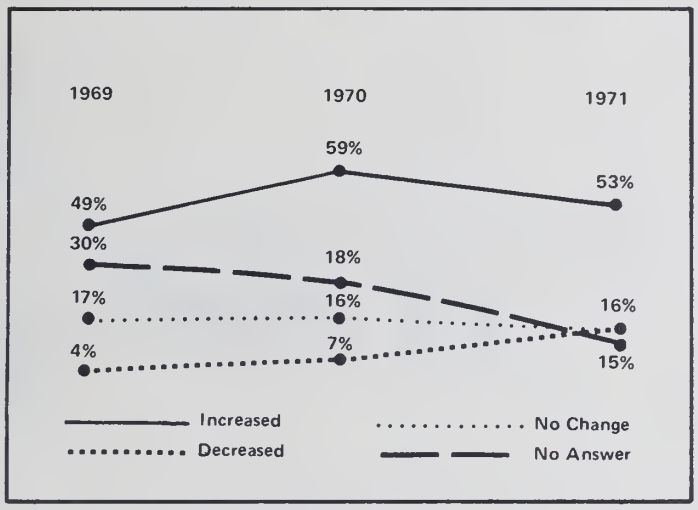
Budget decreases jumped from 4% in 1969 to 16% this year.

In the personnel area, expenditures were up at 66% of the surveyed installations in 1969, before unbundling. This budgetary item was increased at 78% of the user sites last year, and again at 76% of the sites for 1971. Personnel cuts were almost negligible – 2%.

Participants in the nationwide survey represented users of every mainframe manufacturer. In all, 1,500 questionnaires were sent to users, and 40%, or about 600 users, responded.

Besides budget items, the survey covered individual salaries for all DP personnel, from manager and supervisors down to tab and "miscellaneous" equipment operators and trainees.

The results of the survey are available in booklet form, at $5 a copy, from *Computerworld*, 797 Washington St., 02160.




Responses to the question: 'Has your equipment budget increased or decreased for 1969, 1970, 1971?'

## Executives Seen Unhappy With DP

NEWTON, Mass. – Top executives in most major corporations are dissatisfied with the performance level of their data processing operations, according to a survey by International Data Corp. (IDC). Because the problems named are mostly internal, however, IDC forecast continued industry growth – almost 13% for 1972, to over $9.8 billion.

"Top management has found application software development far too slow and the results disappointing but most companies are now increasing control to make existing activities more effective, rather than curtailing budgets," noted C. Oakley Mertz, manager of IDC's EDP Industry Corporate Planning Service.

From a management attitude survey of 50 high financial executives, IDC concluded that the primary problems stem from non-EDP-oriented managers' inability to describe their operations adequately to DP units.

In leaving out "unimportant" details, the manager unknowingly lengthens the development process by a significant margin and prevents the programmer from meeting his deadline, IDC said.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## *Editorial*

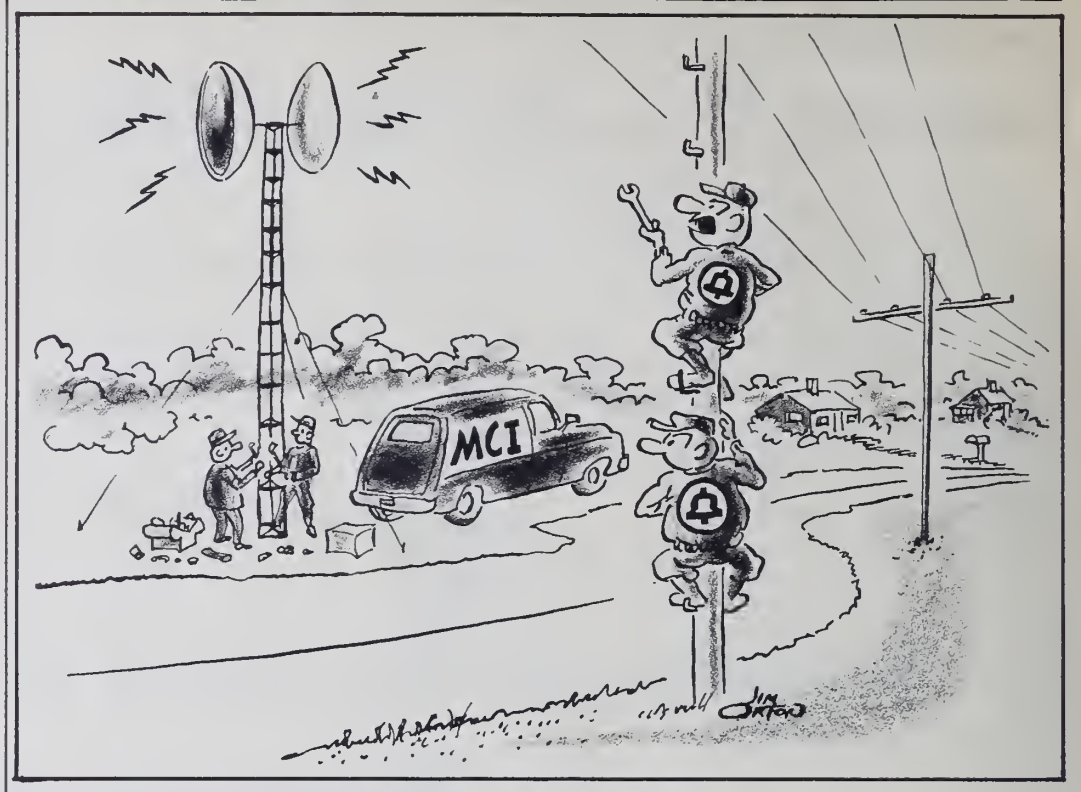
### *The Negative Side*

The report on the Afips-*Time* survey of the public's attitude toward computers contains many comforting statistics, such as 86% of U.S. adults believe computers will create more leisure time for people.

But the good news must not be allowed to obscure the really bad news, such as 24% (one out of every four adults) say they have had difficulty getting a company to correct a computerized bill.

The fact that 17% said the difficulty was the fault of company personnel, not the computer, is still an indictment of computer systems. The personnel often *can't* help the customer. ("Before the computer came, I could have gotten you that information in five minutes; now it takes two weeks.")

The good side of this report is worth reading — the bad side is must reading.




*'There Goes the Neighborhood'*

# *Letters to the Editor*

### How About Utility-Type Price Controls on IBM?

With Miss Van Horn's intent to stir discussion about the role of IBM, I heartily agree; with her suggestion that IBM be split up, I disagree sharply [CW, Oct. 13]. In suggesting any possible moves against IBM, the guiding question must be "how can the business community, and therefore society, best be served?"

The indispensability of the computer becomes more apparent each day. Most large businesses could not operate successfully today without the aid of these machines. Simultaneously, IBM's "technological snowball" is gaining in size and velocity. Allowed to remain intact, this outstanding company will continue to do a fine job offering the business community continued outstanding products and services. Division, as suggested by Miss Van Horn, would result in chaos, a sizable increase in user problems, and therefore, higher costs than those experienced today.

It is obvious, however, that IBM is not fulfilling its awesome responsibility to the business community and society that is inherent with its size and position in the market. Clear cut examples include IBM's repackaging of disk drives in November 1970 and addition of Fixed Term Contracts in mid-1971, which were cleverly disguised and clearly designed to savagely eliminate competition. IBM added substantial insult to this injury by following last July with increased prices on products for which no substantial competition existed. The arrogance of the July 28 price increase clearly calls for action.

The American people have chosen to deal with another technological giant in an extremely effective way which may contain some interesting parallels to our current situation with IBM, when AT&T was allowed to exist as a monopoly.

Considering the substantial adverse effects of splitting IBM and the non-existant prospects of any competitor maintaining a market position in any close relationship to IBM, aren't they becoming a "public utility?" Wouldn't "public utility type" price controls on IBM products along with the expense controls to reduce their ridiculous marketing expenses be a superior solution over the long term?

David Weller

Nashville, Tenn.

### Fixed Charges Necessary, Are Management Function

Alan Taylor opened a "Pandora's Box," and I believe he realizes it. I am referring to his article "Should the Charges Vary With Each Job Execution?" [CW, Nov. 3]. This time I must side with the end user in his quest for fixed charges for two good reasons.

Fixed charges are a must for good planning, and they provide a more stable and useful marketplace in which to make choices. I endorse resource accounting to the fullest extent, but as a further improvement, charges based on item activity would provide a more meaningful basis for user judgment, all of which aggravates the situation and still begs the question.

The only logical answer to me is that the purveyor of computer services assumes the risk of pricing as a manager function.

Price performance is improving at an accelerating rate in proliferating directions. It becomes, therefore, more necessary to measure true costs of every resource possible. Indeed this can be expensive, but isn't it just another problem that good computer management must solve? For a hallmark of good organization is control of costs.

Clifton H. Merry
Systems Officer
Harris Trust and Savings Bank
Chicago, Ill.

### Same Service, Same Cost

Reference the Taylor Report on variable billing based on circumstances [CW, Nov. 3].

Would Taylor like to see other activities follow the same logic. Should 25 people "pay" for a transcontinental 747 flight "based on circumstances?" Or the sole occupant of a restaurant "pay" a varying price for a meal because of the circumstances? The customer expects to pay the same bill for the same service.

Paul A. Hughes, Business Officer
Computer Research Lab.
University of California
Santa Barbara

### Cost Charging Wrong?

The basic point underlying Taylor's discussion [CW, Nov. 3] is the distinction between prices and costs. In theory since price reflects value to the buyer, it may be above or below the vendor's cost having no necessary relationship to it.

The subject will be better understood if a careful distinction is maintained between the cost of doing a job and the price for the job.

It is my present opinion that even in situations in which the service is rendered by an internal agency, the charges made to other parts of the corporation should not be mere cost allocations, but instead should be charges which are equal to the value of the service rendered.

Eric A. Weiss
Sun Oil Co.
Philadelphia, Pa.

### Program Performance User Responsibility

Taylor is technically correct in stating, " . . . the use of EXCPs as a substitute for elapsed time does not really account properly for computer use" [CW, Nov. 3].

The installation promoting a fair-charge system — which uses automated time accounting data in computing costs — provides the user with a combination of memory allocation, peripheral equipment, and software support (operating system) for a fixed hourly rate.

Individual program performance is normally the responsibility of the user, not the installation.

Robert R. Cromer, CDP
Computer Dimensions, Inc.
Detroit, Mich.

### Or Is It?

The more things change, the more they remain the same. Alan Taylor ignores the fact that data processing exists to service the user, rather than an end unto itself. [CW, Nov. 3].

If a payroll system is economically justified because the cost is 50 cents per check issued, then it is disconcerting to find that this cost may vary from 50 cents to $1 because of the mix of work which is being processed.

There is a price the end user is willing or should be willing to pay to have his work processed. The user can understand that there is a variable cost based on the number of activities/transactions, but since the data processing organization is scheduling the work, the user should not be burdened with variable costs which occur because of events beyond the user's control.

Henry J. Cadell
Potomac, Md.

### DP Unit Negotiates Price

We have adopted a unit-cost pricing concept in conjunction with our data processing charges.

Each year we negotiate with our DP group all factors involved in a normal production run for each transaction type processed. A cost value is assigned to that factor, and then the sum of these factors for each transaction type is divided by the projected volume, to arrive at a unit cost for processing that transaction during the coming year.

Each quarter, a review is made of that unit cost to determine if actual volume processed is within ±15% of the projections. If not, the appropriate upward or downward adjustments are made in the unit cost.

We, the user, know that no matter what components our DP group runs at the same time, based upon its optimum scheduling capability, we will be charged a fixed unit price dependent only upon our own volumes. The CPU time allocated to each transaction type is based on the "average" time based on an "average" mix of jobs in the system at any one time.

H.B. Verstandig, Vice-President
Management Services
National Liberty Life Insurance Co.
Valley Forge, Pa.

### SMF Doesn't Go Far Enough

Alan Taylor, CDP, misses the point in his column on varying computer charges [CW, Nov. 3]. The provider of computing services must aim for repeatability of job charges. Repeatability is required because the user would like to budget for computer time and the data center manager does not want the user to specify constraints such as "run this 128K job alone in the 1,024K 360/65."

The problem is that IBM's SMF does not go far enough.

G. Davis, Systems Manager
Grumman Data Systems
Bethpage, New York

### What Is OEM?

We have read you 1971 OEM Supplement of October 1971 with great interest and have only one question. What the "hell" does OEM stand for? Please clarify!

Gerard J. McKernan, CDP
GTE Data Services
Tampa, Fla.

**OEM means "original equipment manufacturer" and refers to the companies that sell to other companies, such as the company that sells keyboards to a terminal manufacturer, or the terminal manufacturer who sells his units to a computer system manufacturer. Ed.**

## The Real Importance of New Tapes

# Characteristics of Tape/Disk Decision Have Changed

I have been writing about questions raised by the new Storage Technology Corp. (STC) tape subsystems. One characteristic of these subsystems is that they produce better performance for System 360 and 370 users than any other available tape unit.

A somewhat equivalent claim is also being made by another competitor. Grumman Data Systems with its Masstape is stressing the advantages of tape storage on-line, specifically the advantages that can accrue with access of up to one trillion bits of information in an average of six seconds.

**The Taylor Report**
**By**
**Alan Taylor, CDP**

These claims are interesting – providing you already know you want to access one trillion bits of information or if 400 kbyte/sec tapes are just what you have been waiting for.

In both cases the really important area may have been missed, or at least not emphasized. (After all both Grumman and STC are interested in quick sales, and the quickest sale is made to the person who already realizes that he needs the product).

But for the industry in general the importance of these announcements is different. So, let us see what really is happening.

### Selling Disks, Not Computers

Over the past 10 years removable disks have become an increasingly essential part of data processing. Disks provide "on-line" storage, as opposed to sequential storage. They originated with IBM Ramac, a system designed for specialized on-line systems.

When they were grafted onto the punch card or magnetic tape systems (IBM 1440) a sudden change in the art of selling computers occurred.

The new technique used was to pick out part of an application – any part – that required or could use on-line storage. At the time no medium or small scale system – outside IBM – had a good on-line storage product.

Once an IBM salesman found this "requirement" for on-line storage he practically could abandon having to worry about cost differences in his main system. He instead sold the computer buyer on the idea of including the particular disk-using applications as prerequisites.

Other things being equal, this tactic had the effect of spotlighting the one application only IBM could provide, and IBM closed the sale.

Later, more suppliers of disk equipment popped up and integrated it into their hardware and software. The technique is more sophisticated than the old "disk" or "no disk" period. IBM salesmen on the 370s, for instance, could let the 370 sell itself – once he had sold the requirement for the large data banks of the 3330 disk.

There have been a few breaks in the pattern as when independent plug-to-plug manufacturers offered inexpensive replacement disk drives which led IBM to the effective price cutting move in the introduction of the IBM 2319.

But within these confines, the technique of selecting computers based on the on-line characteristics of a single application has been the main marketing ploy of the last 10 years.

### Tapes Not Pushed

Tapes during this period have come in a very poor second in technical push. While the key disk capability, on-line capacity, has been pushed from 7 million char./disk pack up to 200 million char./disk pack – an increase of more than 25 times – tapes have only seen their key characteristic jump from the 90 kbyte/sec of the 729 Mod IV to the new 320 kbyte/sec of the 3420s. And that is only a four times capacity increase.

The situation now has changed. While the introduction of plug-to-plug tape units has been accompanied by an up to 35% drop in IBM tape prices, the new STC and Grumman introductions have new valuable power and performance characteristics that do more than merely change cost equations for the tape units. This not only helps them sell against IBM tapes, but also changes the characteristics of the whole tape/disk decision.

That is the real news these new announcements give the user.

It is now unlikely that the decisions on what system, tape vs disk, is best will be as simple as it was during the 60s. Not for a long, long time!

The question is no longer, "Do we need disks?" – but instead, "How much tape, what type of tape, will save how much disk, and what type of disk?"

Given any particular grouping of applications it is almost certain that there will be both tapes and disk methods available.

It is no longer valid to say that tapes are to be restricted to the jobs only tapes can do. If a job requires the updating of a file of 3 million records overnight (which previously could not be done on tapes because the full time length of the cycle did not make it practical), the new 400 kbyte/sec tape speeds available make it possible.

Similarly, if an application requires the accessing of information within a minute it is no longer necessary to have the information on disk because the Grumman system will – (when it is delivered) – be able to supply it adequately.

This does not mean everything on disk has to be pulled off and put on tape. It means that disk is no longer the key area to be treated specially.

Now the design of a system requires more than just the decision to go disk, with minimum tape, or go tape, with minimum disk. Instead the decision must include what is the best of an infinity of possible partnerships between the two, with neither having the pre-eminence that the disks have had in this past decade.

The coming competition between tapes and disks will be a lot healthier for both tapes and disks. Tape expertise will be pushed faster. Disks will find the technical incentive to keep up with the advancing strength of tapes.

The winner of course will be the user – And that's what I like most of all.

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*The Professional's Viewpoint*

# Managers Should Know, Notify

Data processing professionals, according to the recent survey on this page, agree that they have the responsibility to know what is going on in their installations. They also feel that they should be aware of Government rules and regulations so they will know when the laws are being broken.

Around 85% of the respondents agreed with this position and brushed aside the argument that it was the duty of the users rather than the data processing person.

However, they did not argue that the user was not responsible, they merely said the data processing person was.

The split was slightly less one-sided regarding what action to take when they discovered something was not going properly. Eighty percent claimed that management should be notified while 20% asked for more vigorous action such as refusing to run, or resigning.

When a law was being broken, the vigorous action percentage went up to 28%.

### Action First Step to Professionalism?

Among the people arguing for a refusal to run was the immediate past President of DPMA, James Parker, CDP, who commented that "Action as indicated above (Refusing to Run) is one step toward our attaining true professional status."

He was supported, among others, by E.T. Dolan, CDP who also gave Refusing to Run as his response and then said, "My action and responses are all based on the CDP code of ethics." The only attorney/CDP responding also support this view although he did not give the basis of his answers.

However, most people voted for protesting to management rather than more vigorous action.

R.H. Alneroth, Atlanta, Ga. stated that Refuse to Run and Resign . . . result in the same abdication of responsibility while P.H. Laughlin, CDP called it a "Cop-Out!"

Nearly as many people believed that the data processing professional should have the right to check on the actions of other departments when the computer was being blamed for various faults, but again objections were raised.

Mr. Koslowski had a counsel of perfection, in writing "Eliminate any possibility of justifying computer blaming."

Generally, comments fell into two subject areas – the one reflected by the first question which queried whether the DP manager should have the right to review other departments correspondence to check on Blame the Computer allegations; and those which dealt with the problems arising when illegal or inaccurate output was being provided during a computer run.

**Comments regarding Blame the Computer allegations included:**

— — —

The DP manager should be able enough at organizational and interpersonal manipulations so that he can put a stop to damaging correspondence without having to protest formally, or to resign.

I have yet to see an in-house protest that did not backfire on the protestor, often costing him a promotion, sometimes his job. If a manager is worth his salt, he can solve this problem without others recognizing how great a problem it was to him. – T.D.C. Kuch, Bethesda, Md.

— — —

This whole question is concerned with the level of DP interfaces with company management – no direct interface in many instances. – O.R. Smith Jr., Tuscallosa, Ala.

— — —

He should have the right to review correspondence directed outside the organizaton in a mass mailing in the same manner that the legal department normally might review such correspondence. I do not believe he has the right to review internal correspondence. – John D. Boie, CDP, Milwaukee, Wisconsin.

**Comments on legal and accuracy questions included:**

— — —

The answers presume that there is no systems authorization, review and approval entity (i.e. internal auditors, project manager, EDP Steering Committee, etc.) – C.E. Rynski, CDP, Milwaukee, Wisconsin.

— — —

Would say that the duty mentioned in question 2, 3, and 4 should mean the application by the DP Manager of common sense business principals in contrast to extensive legal research. – Robert A. Best, Jacksonville, Fla.

— — —

While not responsible for preventing these things, DPM must remain sensitive to their detection; should notify management as indicated above. – L.F. (Buck) Bonner, CDP, Houston, Texas.

— — —

In any case where I have circled "protest" the degree of the seriousness of any given instance may well warrant resignation or notification of an appropriate outside agency. – Robert D. Kress, Englewood, N.J.

— — —

DP Manager cannot keep up with all laws and regulations to see if they affect his operation. Legal, personnel and accounting auditors should notify DP of changes. – Kirk Powers, Waynesboro, Virginia.

— — —

It is the duty of the DP Manager to be informed about all aspects of laws, rules and regulations. However, it is not his decision to refuse to run existing programs; top management should decide. – Allan D. Walthers, San Jose, California.

## Are These Your Professional Opinions?

In parentheses following each question is an update of professional opinions expressed by respondents to the Professional Rights & Duties Opinion Questionnaire, previously published on this page. Do you agree with the majority conclusions as indicated in parentheses?

1. **A DP manager does have the right to review other departments' correspondence which blames the computer for some action.** (84% agree, 8% disagree and 8% have other solutions.)

Do you agree?_____ If not, why not?_____

How should review procedure be initiated?_____

_____

2. **A DP manager does have the duty to know when his applications break the law, or government regulations, or give inaccurate output.** (76% agree, 5% disagree for inaccurate information; 89% agree, 6% disagree for regulations; 90% agree, 5% disagree for laws. Balance give other solutions.)

Do you agree?_____ If not, why not?_____

_____

3. **A DP manager, when he knows that his applications are improper in that they are producing inaccurate output, breaking the law or government regulations, should notify or protest to management, but should not refuse to run the application, or resign.** (45% for protesting and 34% for notification only, vs 16% for refusing to run and 6% for resigning.)

Do you agree? _____ If not, why not?_____

_____

How should notification or protest be handled? _____

_____

Other comments_____

Name: _____ Address:_____

_____ CDP Holder?_____ SCDP Member?_____

**The Professional Questionnaire shown above was recently published on this page. The responses already received are discussed in the article alongside and shown in parenthesis on the questionnaire. Professionals, whether members of the Society of Certified Data Processors or not, are invited to give their views either directly for publication in the Professional Page, and/or for inclusion in the forthcoming fuller publication of the results. Send the form to Professional Viewpoint Page, Computerworld, 797 Washington St., Newtonville, Mass. 02160.**


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# Jobs and Professionalism Highlight Acpa Conference

By E. Drake Lundell Jr.
Of the CW Staff

GAITHERSBURG, Md. – "This is just the start," Paul Notari, president, told the recent Founder's Conference of the Asocation of Computer Programmers and Analysts here.

Highlighted by the keynote of Dr. Ned Chapin the first meeting of the one-year old organization explored issues ranging from education of systems analysts to standards in the industry, with a great deal of interest in current problems and professionalism and employment thrown in along the way.

The hottest topic of discussion revolved around jobs and professionalism with Terry Kuch, senior systems analyst at the National Institutes of Health suggesting that the profession of programmer and systems analyst might be about to fade from the scene.

He said that as the general public becomes more versed in the languages of computer systems, the need for the middleman or programmer will be gone.

At the same time, however, he said there would be a need for the executive that understands the complete information flow in a firm and who can design entire systems – not just computer systems to aid that flow of information.

In the area of employment, the group was advised that "the bloom is off the rose for programmers and systems analysts" by Ed McClaren, president of Computer Careers Inc.

He said that management was getting very sophisticated in what they want the computer to perform and are increasingly looking on programmers and systems analysts as "technicians" to implement those desires.

Programmers and analysts will have to think at least five years ahead and keep ahead of changes that are occuring in the business if they want to have marketable skills in the future, he added.

Good areas to be in today, he said, included data communications, large scale commercial systems, plant automation, terminal applications and minicomputers, but he noted that the mini area required a hardware background more than software.

Jerry L. Ogdin, an independent consultant, suggested that all existing and proposed language standards be abolished because they force programmers to use obsolete conventions in writing new programs.

He said that most of the arguments for standards "fall apart on close examination." For example, he said that it was false to believe a standard made a program machine independent. He said that any good programmer would take advantage of the idiosyncrasies of the particular machine and compiler to make the program run faster, but that this makes it machine dependent.

Present standards box the user in, Ogdin said, and that is why there are not many new programming languages developed in this area.

Ogdin proposed that the American National Standards Institute begin immediate work to synthesize a Meta language that could be used to describe other languages. Such a language would allow for the development of specialized languages tailored to suit specific application areas, he said.

Systems analysts have no value per se and have to achieve results for an organization to have any value, Herbert B. Lassiter, president of Lassiter and Co., said.

At the same time the work of a systems analyst consists primarily of people-related tasks and not programming tasks, he said.

The systems analyst needs to be oriented toward the organization he serves, Lassiter said, while the programmer can be machine oriented.

## Programmers Salaries Increase Faster Than Productivity: Chapin

GAITHERSBURG, Md. – Programmers must find ways to increase their productivity and reduce the burden of unproductive work if they are to be successful in the future, Dr. Ned Chapin, a West Coast DP consultant told the founder's conference of the Association of Computer Programmers and Analysts here recently.

Chapin said in his keynote address that productivity of programmers and analysts does not increase as fast as their salaries and that most employers feel that the productivity of a programmer with 2 years experience more nearly equals his salary than does the productivity of someone who has 5 years experience.

He said the programmer with 5 years experience gets 70% more than the one with no experience and that the man with 2 years experience only gets 20% more than the unexperienced.

If programmers were paid by results done, he said, "not many employers would hire people with over 2 years experience."

### Unnecessary Tasks

The reason that productivity of programmers and analysts does not increase is primarily due to the heavy load of unnecessary and unproductive tasks that many programmers have to carry, he said.

Much of the unproductive time is spent "re-inventing" the wheel, or performing work that has already been done, either within the firm or in another area, he said.

Another factor is that programmers and analysts are often called on to implement ineffectual systems that are either uneconomical or do not serve the needs of the using organization, he added.

At the same time, many programmers and analysts find that they have to spend much of their time working on systems that are either ill-defined, which wastes time and money, or on systems that are short lived, such as special one time reports.

Another burden that programmers and analysts have to carry is that of rework of systems that were either ill-defined or poorly designed in the first place.

The programmer and analyst of today is also still using "horse and buggy" techniques, Chapin said, that reduce his effiiency and productivity.

Today, Chapin suggested that most programmers and analysts have to spend 50% to 60% of their time on unproductive work. At the same time, he indicated that management is often unaware that a problem even exists, so there has not been much movement to improve the situation.


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GTE INFORMATION SYSTEMS

# Random Notes

## 'Optimizer Plus' Replaces ANS Cobol-Generated Code

PHOENIX — An enhanced version of the Cobol Optimizer (Optimizer Plus) from Capex Corp. reduces program execution times by replacing some compiler-generated code sequences with functionally equivalent but faster machine instruction series.

The Optimizer Plus package is available for varying configurations for one-time charges from $6,000 to $15,000, or monthly leases from $220 to $550. Capex is at 2613 N. Third St., 85004.

### Library Routine Compacts Data, Blocks Standard Dump Reading

BOSTON — The contents of a disk-oriented source program library are protected and the library takes up less storage space with a new data compression feature built into the Program Manager package from Cullinane Corp. One Boston Place, 02108.

The feature changes all data into a special compressed character set that can be different for each user and changed at intervals. Standard disk dump utilities will provide an unintelligible mass of blanks and a few characters.

### New York, California Analysts Access On-Line Security Data

ROSLYN, N.Y. — Security analysts in and around New York City and within the service area of Remote Computing Corp.'s time-sharing network in California can access an on-line data base of stock market information that has been compiled and is updated daily by Merlin Systems Corp.

The data is said to include opening and closing prices on the major stock exchanges, as well as pertinent information about over-the-counter stocks and the bond market. There is no initiation fee or monthly minimum charge for the service, Merlin said from 1044 Northern Blvd., 11576.

### CPA Compares IRS, Cobol, BAL

BETHESDA, Ma. — IBM 360-370 users trying to evaluate information management systems can use the Cost/Program Analysis (CPA) service provided by Sigma Data Computing Corp. to compare costs of programming under Inquiry and Reporting System (IRS), a Sigma package, with costs of programming in Cobol or BAL.

CPA matches user-defined evaluations of the program's difficulty and his hourly rates against standardized estimates of the time required by each step in program development. The service costs 25 cent/program with $5 minimum. Sigma is at 4720 Montgomery Lane, 20014.

### Liquor Dealers Go On-Line

BLUE BELL, Pa. — Wholesale liquor dealers throughout the U.S. have begun to use a real-time management information service developed by Univac in cooperation with the Wine and Spirits Wholesalers of America. The system may be adapted, ultimately, for use by distributors in other industries.

The Unifacts service processes orders and prints invoices to retailers including due dates, discounts, credit data and other information. It also generates periodic reports and handles on-line inquiries.

## T-7 Has Five Modules

# Compiler Uses Cataloged Procedures

By Don Leavitt
Of the CW Staff

CINCINNATI, Ohio — IBM 360 programmers can avoid much of the time and effort normally required to redefine coding steps as specifications change with the T-7 non-procedural, high level language compiler from Thoman Software Corp.

T-7 can solve any commercial DP problem, including any number of sequential or random I/O files, through a framework of five basic processing modules: sort merge; accumulate; list/tabulate; reformat; and build/update, Thoman said. The modules can be used separately or linked together in any sequence within the user's program, according to the company.

The actual processing done within each module is normally coded by user references to predefined and cataloged functions, similar to macro capabilities in an assembler level language. After naming the function, the user completes a set of parameters so that the generated code will fit his specific requirements.

While the cataloged functions are available for commonly used processing steps, T-7 also allows the user to code his logic directly in the source code of his program. Whether creating functions or coding on the program level, the T-7 user has a complete set of instructions, similar to PL/1, available, Thoman said.

The source library facility eliminates the need to respecify files, data definitions and data relationships, as well as the standard processing functions. The processor also includes COPY and INCLUDE features, a spokesman said.

T-7 can use any standard sequential, index sequential or direct file; no reformatting is required.

Normally, T-7 requires as little as a 24K DOS partition for any of its processors, but it can utilize as much core as allocated. User programs are not limited in size by anything in T-7 logic. In fact, the T-7 processors include virtual memory or paging logic so that roll-in/roll-out of program and table segments is handled automatically when partition or core size is exceeded, the company said.

T-7 is available for use under either DOS or OS/360, and costs $23,000 from Thoman at 8050 Montgomery Road, 45236.

# 'Interbase' Has Fast Accessing, I/O Choices for Data Retrieval

TAMPA, Fla. — IBM 360-370 users operating under either DOS or OS/360 gain the ability to input, process, store and retrieve information from a data base and to generate output in a choice of formats, with the Interbase package from International Data Resources, Inc. (IDR).

The package, a self-contained load-and-go processor, provides its own access methods which are "significantly faster" than conventional methods, according to IDR. Existing files that use conventioanl organizations can also be accessed, however, a spokesman added.

Input to Interbase is essentially free form although "a few logical conventions" have been established. Files may be merged, sorted and linked together. Almost any type of data manipulation is possible, and no restrictions are set on either number or type of I/O files, according to IDR.

Report generation is eased through routines to print, list, tally, summarize and correlate data. Graphic output can be displayed by either frequency distribution or time plot. As many as five variables can be plotted against time, the company said.

The Interbase package is a set of 80 programs, written in BAL, which require 50K bytes of core under DOS, or 128K bytes under OS/360. The package is also available to RCA Spectra users. In addition to core, the system requires a disk drive and the Decimal Arithmetic feature.

Interbase for DOS users costs $25,000; for OS, $28,000. IDR is at 2907 Bay To Bay Blvd., 33609.

# 'DTA' Resolves Tape Conflicts

PITTSBURGH, Pa. — Assignment, scheduling and utilization of magnetic tape units is no longer a problem for DOS/360-370 users operating in a multiprogramming environment, with the Dynamic Tape Allocation (DTA) software from Venture Systems Associates.

DTA is normally transparent to the user and requires no change in application programming. The user continues to make normal tape assignments, but is relieved of concern over possible conflicts in assignments.

With the new software, DOS job control coding has been modified to trap conflicting I/O assignments involving tape. Once a conflict is recognized, DTA reassigns the user symbolic system number to an unused tape drive, and displays a console message advising the operator to mount a tape on the newly assigned device.

All subsequent assignments within a job that reference a device that had to be reassigned will be reassigned to the same device, a Venture spokesman said. At end of job, all reassigned tape drives are unassigned, he added.

DTA does not use any core that would be otherwise available for user application programming.

IBM's DOS Release 25 is supported by DTA, which is available for $3,000 through P.O. Box 13142, 15243.

# ADL Evaluation of 360 Sites Improves Output, Cuts Costs

CAMBRIDGE, Mass. — Users who aren't getting as much performance as they should out of their present equipment, or who are considering a move to a larger system can get an impartial evaluation of their situations through the Evaluate: 360 service now being offered by ADL Systems Inc.

The service is a three-stage study program that analyzes a user's current work load, recommends specific changes in equipment, software and procedures, and then provides detailed estimates of the improved performance to be derived from implementing the recommended changes.

Evaluate: 360 is intended to help a user quantify the expansion potential remaining in his current equipment. In many cases, 25% to 35% expansion is possible, with an actual net decrease in total cost, on configurations the user had considered saturated, a company spokesman claimed.

Evaluate:360 users can expect a minimum cost/performance savings of at least 5% to 10% of their annual hardware budget, he added. Individual situations would determine whether the savings would be in the form of an actual reduction in hardware costs, he noted.

In the first step of the evaluation, ADL Systems personnel do an on-site investigation of the user's operation, from work habits to current equipment specification and usage. In the second stage, changes in hardware, software and procedures are considered.

Finally, ADL Systems does a software evaluation of contemplated alternatives, to measure and modify them until an optimal mix of changes is determined. The total process takes four to six weeks and will cost the average user 1% to 2% of his annual hardware rental budget. ADL Systems is in Acorn Park, 02140.

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## The Forum and Exhibition Schedule

### Each Day

**9:00-9:40**
**Keynote Address**

A nationally known expert who is independent of influence from or affiliation with vendors, delivers an address on the subject of the day. The speaker presents a picture of the state of the art in the subject area under scrutiny. It will be a call to action for the panel discussion and for future efforts by all computer users. The national speaker observes the panels, and delivers a summary during the conference luncheon.

**9:40-10:30**
**Panel Discussion**

Panelists are regional experts in the particular field. They have first-hand experience with the latest equipment and services, and they are known in their areas for their progressive management principles. They are not representatives of computer manufacturers. Principles and operations are the target for discussion, not equipment suppliers. General questions are encouraged.

**10:40-11:45**
**Workshops**

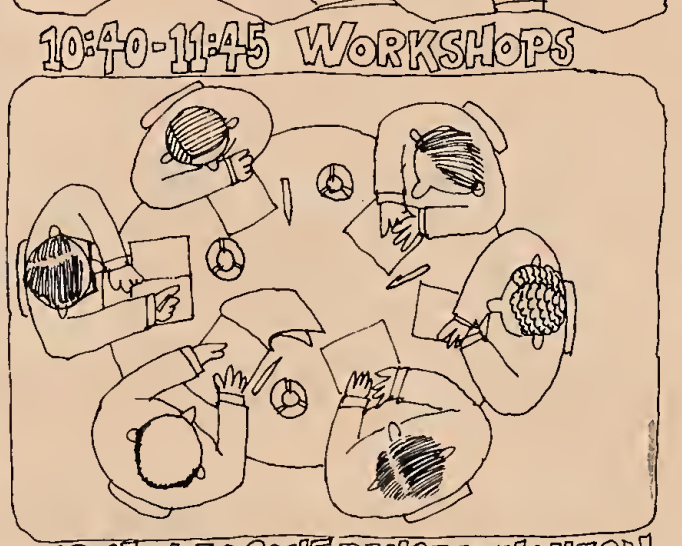
Each panelist leads a workshop — and this is where your specific questions are discussed and worked out. Where the discussion goes depends on your needs. What do you, the user, want to learn or discuss?

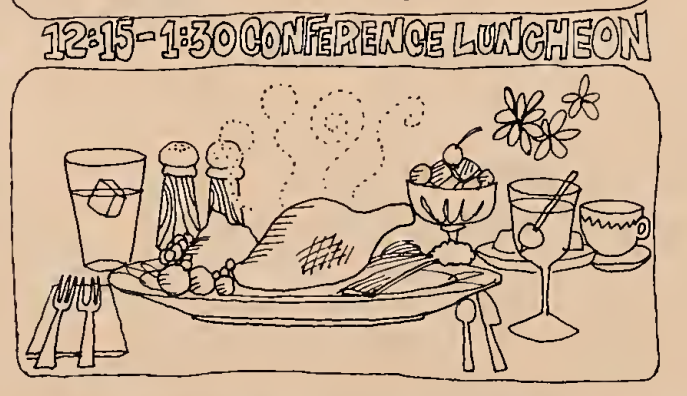
**12:15-1:30**
**Conference Luncheon**

The keynote speaker summarizes the important points of the day's panels and workshops over a pleasant lunch.

**1:00 PM-9 PM**
**Exhibits Open**

You've listened and talked all morning. Now you can see the latest equipment and services in action. 60 exhibitors present their latest, in a pleasant, uncrowded exhibit hall.




## TOPICS

On each day of our three-day show we are devoting our forums to a particular topic of wide current interest to computer users.

**First Day**

**DATA ENTRY**

The keynote session on data entry is followed by panels and workshops on

- Keypunch Replacement: key to tape, disk and cassette devices
- OCR
- Intelligent Terminals (distributed processing)
- Direct Data Entry/ Source Data Automation

**Second Day**

**DATA COMMUNICATIONS: THE CHOICES**

The keynote address deals with the overall picture, and is followed by panels on these subjects:

- Communications equipment from mainframe makers and common carriers
- Communications equipment from independent suppliers
- Data Transmission via private (lines, microwave) networks
- Data Transmission via carriers (lines, microwave)

**Third Day**

**OPERATIONAL EFFICIENCY**

Panels and workshops deal with the following topics:

- Core Extensions
- System Utility Software Modification
- Independent Peripheral Usage
- Dedicated Systems vs. General Purpose Computers

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Some of the details are above. The rest will fol us, and you'll be there when the Computer Car

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## Preston Goes Trucking Along

WASHINGTON, D.C. – The FCC has been asked to take a third; and perhaps fourth look at the 480-mile, 720-channel microwave system it originally approved last February for Preston Trucking Co., in New York, New Jersey and Pennsylvania.

The Preston plan, as currently approved, calls for Transportation Microwave Co. (TMC) to build, own, and maintain the system, leasing it to Preston and other truckers at fixed rates.

The commission took a second look last spring after receiving several petitions for reconsideration. As a result of the review, in August it again approved the basic system, but set up a rulemaking inquiry to be prepared for any other similar networks.

That inquiry is proceeding, with comments received from a number of interested parties. But the situation has been clouded by a petition from Preston to open up the approved application to include the company's major terminal in Preston, Md., and to permit "one-hop" use of the system.

MCI, a specialized common carrier and one of the original opponents of the Preston arrangement, has asked the U.S. Court of Appeals that the whole proceedings be remanded to the commission for reconsideration of the basic issues.

The carrier bases its appeal on the revised application from Preston, which, MCI said, provided facts that had been unavailable when the earlier decisions were made.

# PUC Sets Interconnection Tests

By Don Leavitt
Of the CW Staff

VAN NUYS, Calif. – A recent ruling by the California Public Utilities Commission (PUC) has set up a test situation for various methods of interconnecting user-provided equipment with the Bell switched network.

Phonetele, Inc., the complainant, received a formal "slap on the wrist" for wiring its Phonemaster 1040 telephone traffic restriction units into the Bell system at several user sites, but the PUC also told Pacific Telephone it should have provided the interconnection, at no cost to the user.

The commission agreed that the Phonetele-wired terminal blocks apparently had not caused any damage in the eight or nine months they have been installed, and that they should be allowed to stay in place as a means of evaluating that mode of installation.

Pacific Bell argued, and the commission agreed, that connections made by an outside vendor were not allowed by the current tariff regulations. The utility said from now on it would install connecting arrangements known as ZZAGMs. The PUC approved this plan, and specified there be no change for this arrangement for the first 10 users.

The PUC stressed the fact that the proposed ZZAGM-Phonemaster combination was also a test situation and that it would be watching the results of the test closely. In the event that the ZZAGM proved incompatible with the Phonemaster, Pacific Bell was ordered to install simple terminal block arrangements similar to those already being used in the current Phonemaster installations.

## Communications

Phonetele said it was pleased with the decision. The utility should be able to interpose any hardware it feels it must, the company said, as long as there is no charge and no interference in the service offered the user.

Commenting further, Phonetele claimed that Pacific had tried to use the ZZAGM configuration shown the PUC, but had been unable to make it compatible to the Phonemaster.

A redesigned interconnection is now being used, but Phonetele said it may insist that the utility use the basic terminal blocks which the commission specified as the alternative to the originally proposed ZZAGM.

A further hearing before the commission will study the results of the two methods of interconnection and presumably make a final ruling on the case.


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## Data Briefs

### ATT Modifies Wats Tariff For User-Provided Units

WASHINGTON, D.C. – AT&T has proposed changes to its Wide Area Telecommunications Service (Wats) tariff, no. 259, to allow direct electrical connection of customer-provided equipment with the carrier's network.

Various connecting arrangements are covered in the tariff revisions, filed with the FCC to become effective on Dec. 9, but they are related to voice transmission, a Bell spokesman said. Proposed by the Long Lines Division of AT&T, the new rates and regulations do not apply to the sending or receiving of data.

### New Front-End Designed For Univac 1100s, 400s

MAHWAH, N.J. – A communications front-end for Univac 1100 and 400 series CPUs, the C2000 is now available from Teleprocessing Industries Inc. It is said to be more versatile, to occupy less space and to reduce costs more than conventional front-ends.

The C2000 supports 9,600 bit/sec synchronous circuits, 1,800 bit/sec asynchronous circuits and Telex, TWX, Dataphone and Western Union's Broadband (BEX) services. It terminates up to 256 lines directly or 975 indirectly.

The company is at 82 McKee Drive, 07430.

### Interchangeable Equalizers Tie Modem to Varied Circuits

REXDALE, Ontario – The ESE 48/QM modem series from ESE Ltd. support transmission rates from 2,400- to 4,800 bit/sec in a 1,200 Hz bandwidth on dedicated or switched data channels. The modems accept interchangeable equalizers of the manual, automatic or adaptive types.

The available 48/QM configurations cover most C2 conditioned circuits, dedicated C1 and most Type 3002 unconditioned circuits, and dedicated or switched C1 conditioned circuits, ESE said. The firm is at 1780 Albion Road.

## Bits & Pieces

### Turnkey Mini-Based System Speeds Surveying Tasks

ORANGE, Calif. – Intended for use by consulting engineers and land surveyors, the Syncomp Macro/70 is a modular minibased system with a complete survey and subdivision software system. Traverse adjustment, map check and other surveying programs are available.

In addition to the turnkey software, the system has Fortran, text editor, math library and assembler programs. With a lease price of $238/mo and a sale price of $11,895, it comes with a 16K CPU, keyboard, printer and paper reader/punch. Other peripherals are available from 1 City Blvd West, 92668.

### Low-Cost Calma 185 Digitizer Outputs Cards or Paper Tape

SUNNYVALE, Calif. – The Model 185, Calma Co.'s lowest priced graphic digitizer, features a 48- by 60 in. tracing bed and direct whole-value coordinate output to a card punch or paper tape.

Priced at under $14,000, the Model 185 is equipped with a self-contained scaling feature to permit independent down-scaling of each axis up to 31x and is equipped with three digital displays. Calma is at 70 Kifer Road, 94086.

### Datacraft Reduces Mini Prices

FORT LAUDERDALE, Fla. – Datacraft has cut the prices and increased the speed of its 6024/5 central processor. The basic price has been cut from $15,500 to $10,900. Cycle time has been reduced from 1.2 μsec to 1.0 μsec.

Prices have also been reduced an average of 50% on nearly all of the mainframe options including priority interrupts and I/O channels, the company said. Datacraft's mailing address is P.O. Box 23550, 33307.

### UCC Terminal 2740 Compatible

DALLAS – The UCC 1440 keyboard terminal for computer communications from the UCC Communicatons Systems subsidiary of University Computing Co. features complete compatibility at the touch of a switch with either the IBM 2740 Model 1 or with the IBM 2741.

The UCC 1040 can also be used as a standard office typewriter when not being used as a terminal. It rents for $90/mo, including maintenance and is avialable on a 30-day delivery schedule from 1500 UCC Tower, 75222.

# Ampex Offers Dual-Density Disk Unit

By Frank Piasta
CW Correspondent

MARINA DEL REY, Calif. – Ampex Corp. has joined the crowd of independent manufacturers offering a double-density, 2314-compatible system.

The Ampex DS-324 system offers similar configuration to the 2314, with up to eight drives attachable to a controller. Due to the increase in tracks per surface from 203 to 406, the Ampex system has twice the capacity of the IBM 2314, and half that of the IBM 3330. No provision for a spare drive is made with the Ampex units.

A four-drive system can store 233 Mbytes, equal to the on-line capacity of a 2314, each drive holding 58 Mbytes.

Access time on the Ampex unit is also superior to that of the IBM drive. The average time for the Ampex mechanism is 32 msec compared with 60 msec for the IBM unit.

Performance levels that the user will achieve from the Ampex drives may not be as great as the figures might indicate. Since software would consider each Ampex drive to be two separate 2314s, as is the case with most other dual-density systems, data would have to be carefully stored in order to avoid conflicts that would results in the loss of ability to overlap seek time.

The only software modifications necessary, according to Ampex, are the insertion of addresses from Hexadecimal 0 to F in the equipment table.

An 8-drive DS-324 system costs $150,000. Lease price is $4,600/mo, including maintenance. The prices, Ampex said, represent a 40% savings in cost over an IBM 2314 configuration of similar capacity with 16 drives and two controllers that leases for $8,243/mo.

The Ampex controllers used with the DS-324 system can accommodate either single or dual-density drives, allowing a user with 2314 or equivalent drives to retain his old equipment. The controller provides on-line diagnostics that are said to reduce downtime by permitting drives to be tested during normal operation.

Production deliveries are scheduled to begin in early 1972 from 13031 W. Jefferson Blvd.

# Two HP Time-Sharing Systems Based on Low-Cost 2100 Mini

PALO ALTO, Calif. – Hewlett-Packard has extended its family of low-cost time-sharing systems based on its disk-based 2100 systems with the introduction of two additional models.

The 2000E system is a lower priced version of the company's 2000A, B and C systems. It uses the 2100 CPU with floating point arithmetic, HP 7900 moving-head disk, much of the software developed for the 2000B and C, and supports up to 16 multispeed terminals.

The 2000F is a lower-priced version of the 2000C implemented on new hardware. It adds to the 2000E a 2100 front-end communications processor, up to 188 Mbytes of disk storage, the capacity to handle a high-speed printer on-line, and up to 32 multispeed terminals that can handle up to 2,400 bit/sec.

Both systems use the 7900 disk as a swapping disk. Systems cost is kept down, the company said, by placing system backup on the disk, eliminating the need for magnetic tape drives.

The 2000E uses the HP Extended Basic language and offers operating system features introduced with the 2000B and C systems. Standard features include floating point, program chaining, common statement, user-available system clock, user/system communications, and multi-speed, intermixed terminals.

Both systems include hardware needed to use the HP 2120 Disk Operating System which provides the capability to run files generated in the time-sharing mode and convert batch generated files for time-sharing use.

All hardware necessary to use the HP 20005 Real-Time Executive System is also provided in both systems.

Two levels of libraries are maintained in mass storage. Public library programs are available to any user but can be modified only by the system operator. A private library, accessible only by a unique ID code and password, is available to each user.

Applications programs, including computer aided instruction, Interactive Dialogue Facility, and text editing, written for the older 2000 systems can be used without modification.

The 2000E is priced at under $50,000. The 2000F sells for under $110,000. Deliveries are scheduled to begin in late summer, 1972 from 110 Wolfe Road, Cupertino, Calif.

### 2401 and 2420, Too

# Calcomp Drive Replaces 3420

ANAHEIM, Calif. – Calcomp's 1040 system magnetic tape drives and controllers are intended to replace IBM 3420, 2420 and 2401 drives on 360 and 370 systems.

Two models of tape drives are available. The 345 is intended as a replacement for the IBM 3420 Model 5. Tape transport speed is 125 in./sec resulting in a transfer rate of 200 kbyte/sec, identical to that of its IBM counterpart.

The Calcomp 347 has performance specifications equal to those of the 3420 Model 7. Tape speed is 200 in./sec and transfer rate 320 kbyte/sec.

As many as eight 340 series drives can be attached to one 1040 controller. Drives with different options, such as nine-track dual density (800 or 1,600 bit/in.), seven-track (556/800 bit/in.) or single density (1,600 bit/in.) can be intermixed.

The 345 tape drive can be used with all 360 and 370 models. The 1,600 bit/in. drives, however, can not be used with the 360/22. The 347 is compatible with 360 Model 50 and up, and with all 370s.

The basic purchase price of the 1040 controller is $19,365. The 345 tape drive is priced at $16,073 and the 347 at $19,230.

Under a one-year lease the controller costs $559/mo; Model 345 tape drive, $463/mo; and Model 347, $554/mo. All lease prices include 24-hour, 7-day/week maintenance.

According to Calcomp, lease prices are 10% below those charged by IBM for corresponding models. Calcomp purchase prices, the firm said, are 25% lower.

The first 1040 systems will be shipped in July 1972 from 2411 W. LaPalma Ave. 92801.

# Users Can Order 1442 for IBM 3/10

WHITE PLAINS, N.Y. – The IBM 3/10 disk system user will be able to order an 80-column card read/punch to replace his multi-function card unit that handles 96-column cards.

Prior to this, the 1442 was only available on an RPQ basis on the system/3.

IBM stresses that the 80-column capability is being provided to answer such specific customer requirements as turnaround documents, or for I/O in a data collection system. The 96-column card is the primary I/O medium for the Model 10, IBM said.

With IBM's new 2596 card equipment, small cards may be used in 360-370 installations.

The 1442 for attachment to the 3/10 will rent for $577/mo and sell for $29,825. Shipments begin in April 1972.

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# Computer Set to Foil Tax Evaders

SAN JUAN, P.R. – The Department of the Treasury will soon begin to use twin computers to stop tax evasion, which may be costing Puerto Rico as much as $40 million a year.

That's how much treasury officials expect to recover with closer scrutiny of tax returns and cross-references of inter-government records to make sure nobody pays too much or too little or escapes taxes altogether.

Eduardo M. Figueroa, director of the treasury's electronic center, said his center presently processes the returns of 300,000 individuals and 20,000 businesses.

The treasury's computers operate continuously and perform 2 million transactions a day. Besides taxes, they do budget accounting and payroll for each of the 50 agencies that make up the commonwealth government of Puerto Rico.

Next year's tax returns will be fed through twin 370/145s by 250 data processing specialists, including 30 programmers, who staff the electronic center.

Taxes can be paid through 40 data terminals at 11 collection offices, or "colecturias," in the metropolitan areas of the island. The terminals convert payments to electronic pulses and send them directly to the computer through telephone lines conditioned especially for data communications.

# Some Hands Open Doors, Some Don't

NORTHVALE, N.J. – A breakthrough in positive personal identification has been achieved with the development of an electromechanical device which instantly identifies persons seeking access to controlled areas through the use of hand measurements, according to the manufacturer, Identimation.

The Identimat 2000 reduces hand measurements to a digital code and stores that code on the person's ID card and/or in a computer memory bank.

Only authorized persons whose hands match the coded data on their ID cards are allowed access to the controlled areas. A card holder can be allowed access to specified areas and denied access to areas for which he is not cleared. The electronic, solid state logic of the Identimat 2000 gives a "go-no/go" signal which can open a door or keep it locked.

According to the company, the basic unit can evaluate an infinite number of users at a cycle time of about 3 sec – the time required to step up to the unit, insert a card, place the hand on the lighted surface of the unit for optical scanning and remove the hand and card.


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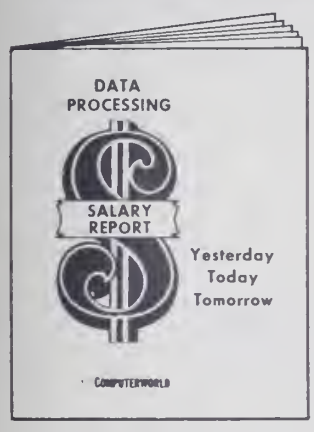


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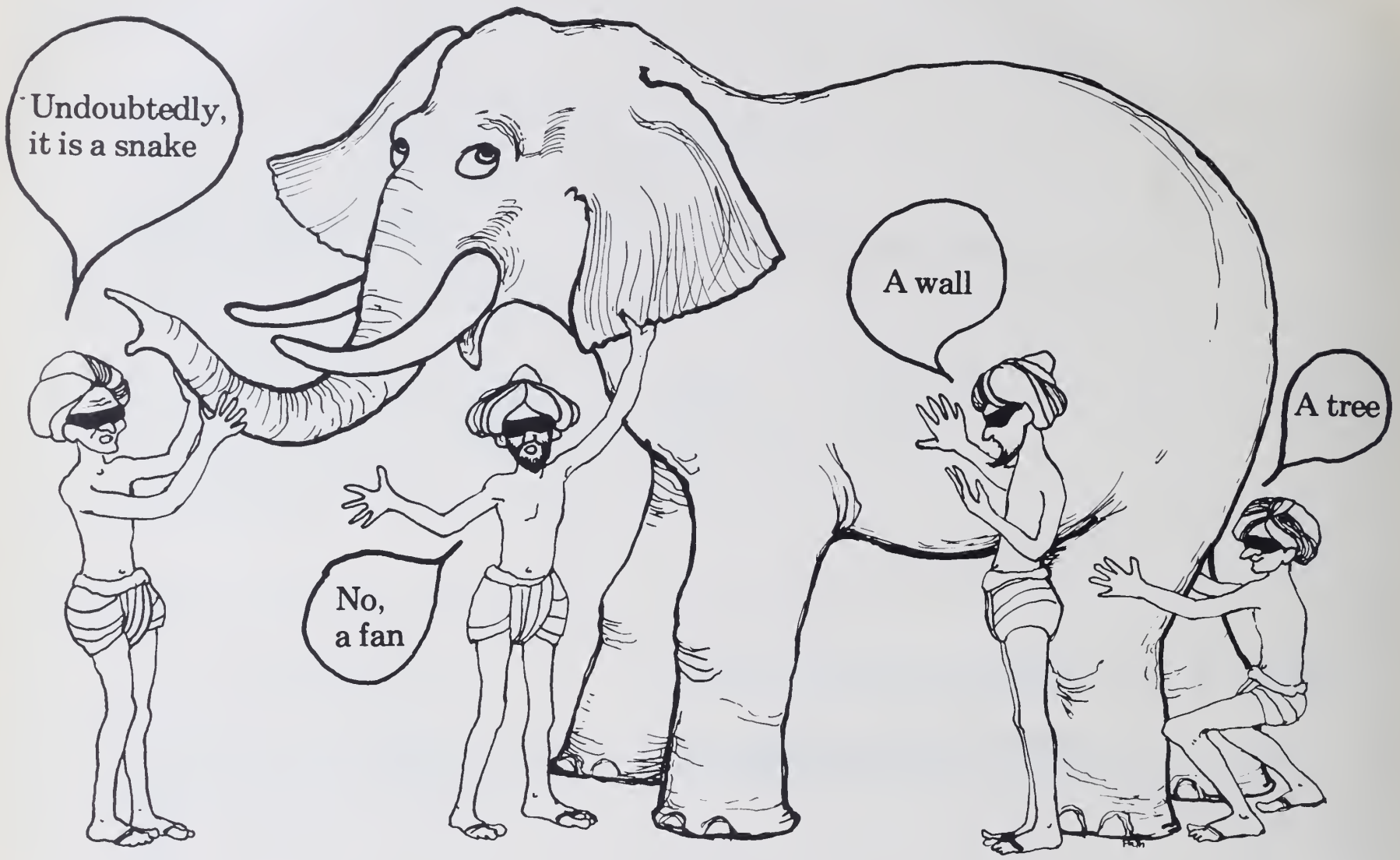


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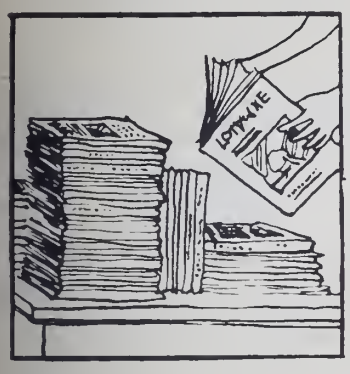

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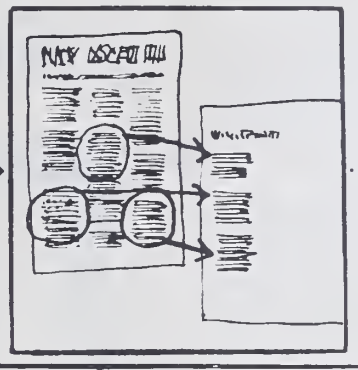

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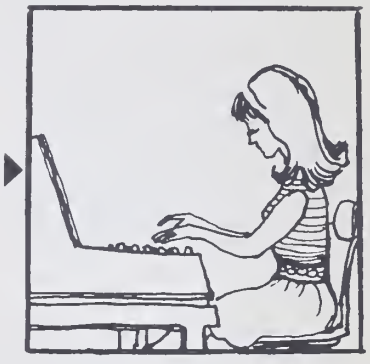
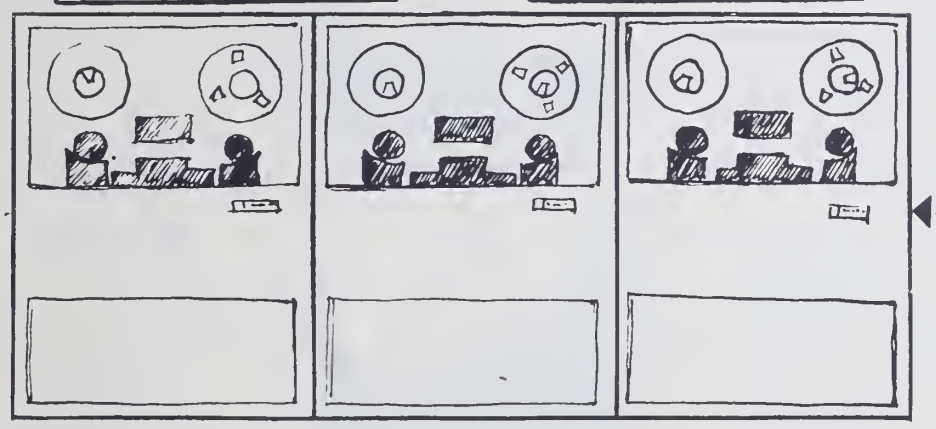
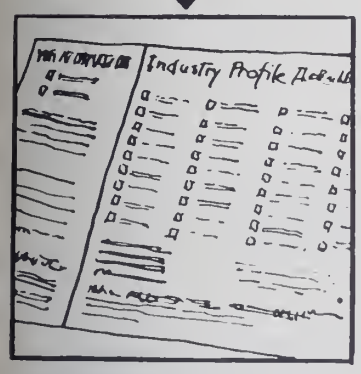
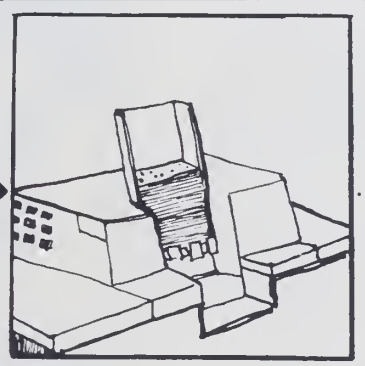




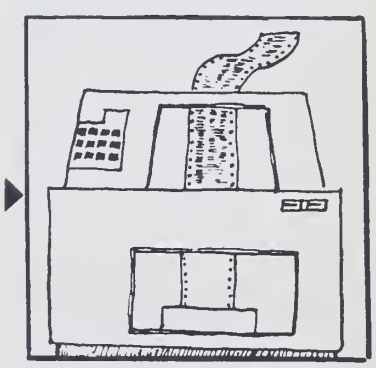



When your order is received...

...Your selected subjects are then keypunched to comprise your "interest profile."



Each month, your "interest profile" cards are then exposed to the new month's file of 6,000 abstracts. A unique computer system then examines every article for relevance to your interests.



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(check boxes opposite desired subjects)

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- ☐ Minicomputers
- ☐ Peripherals
- ☐ Services
- ☐ Software
- ☐ Supplies
- ☐ Terminals

**2 Analysis Factors**

- ☐ Abuses
- ☐ Applications
- ☐ Contracts
- ☐ Costs
- ☐ Education
- ☐ Foreign Trade
- ☐ Installations
- ☐ Languages
- ☐ Leasing
- ☐ Legislation
- ☐ Licensing
- ☐ Litigation
- ☐ Malfunctions
- ☐ People
- ☐ Prices
- ☐ Regulations
- ☐ New Products
- ☐ New Services
- ☐ New Systems
- ☐ Patents
- ☐ Investments
- ☐ Mergers & Acquisitions
- ☐ Marketing Trends/Forecasts

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- ☐ Communications
- ☐ Medical/Hospital
- ☐ Data Processing
- ☐ Transportation/ Reservations
- ☐ Financial
- ☐ Information Transfer
- ☐ Education
- ☐ Law Enforcement
- ☐ Legal
- ☐ Government
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(list any specific companies whose activities you wish to follow)

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December 1, 1971



## CI Notes

### National Sues PDA

NEW YORK – National CSS, Inc. is suing PDA Systems Inc. in Federal Court here for "breach of faith and confidence by their wrongful taking and using of confidential computer programs."

National claims PDA developed a sort/merge and Isam command program under contract to National for the exclusive use of National, but then sold the programs to Grumman Data Systems in violation of the contract and professional ethics outlined by the Association for Computing Machinery.

National has warned all users of IBM 360/67s that they may be in violation of the law if they use the package from PDA.

### Boothe Discontinues Operation

SAN FRANCISCO – Boothe Computer Corp. has discontinued the unprofitable operations of Boothe Resources International. In connection with the termination the company wrote down its investment in Boothe Resources to net realizable value resulting in an extraordinary loss net of taxes of about $1.2 million.

Boothe Resources' unprofitable operations during the first nine months of 1971 adversely affected their earnings by 22 cents per share, the firm said.

### CRT Display System Patent Out

PLAINVIEW, N.Y. – Sugarman Laboratories, Inc. holds patent No. 3,581,290, covering a basic system design of CRT terminals. The patent was issued to Dr. Robert Sugarman and was, in turn, assigned to Sugarman Laboratories, Inc.

The system relates to a method for providing improved display capability on a CRT, not only in terms of the lines and characters displayed, but also in terms of the flexibility of presentation of the information, Sugarman said. The benefits result from the use of multiple shift registers combined to form a circulating memory unit. The shift registers provide a reliable and inexpensive memory in which data may be stored for display and execution by a microprocessor.

### Supershorts

Data Disc Inc. will be the exclusive supplier of head-per-track disk memories for Datacraft Corp.'s 6024 computers.

– – –

The Service Division of GT&E Information System Inc., is now providing maintenance service for Vogue Instrument Corp. computer and telecommunication printers.

– – –

Syntonic Technology, Inc. will provide installation and maintenance service for Centronics Data Computer Corp. Model 101 line printers.

– – –

Special industry briefings, co-sponsored by the Air Force Electronic Systems Division (ESD) and the Lexington-Concord Chapter of the Armed Forces Communications and Electronics Association, are scheduled at Hanscom Field, Mass., on Dec. 6-7 to acquaint industry with ESD policies, procedures, and opportunities.

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## End of Mini-Conglomerates?

# Tracor Drops Computer Product Business

By E. Drake Lundell Jr.
CW Computer Industry Editor

AUSTIN, Texas – Tracor Inc., which has recently been billing itself as the unknown giant of the computer industry, has decided to drop all computer hardware operations, but will continue Tracor Computing Corp., a services company.

The move is interesting because Tracor was one of the first firms attempting to develop a "mini-conglomerate" of computer peripheral firms by using its base in other business areas to purchase computer companies – a trend that several firms have followed.

Examples of this trend include moves by Digitronics, EM&M and Itel and others that have used their OEM or leasing bases to either enter the end user market or purchase companies serving that market.

Other firms, such as Gould Inc. and formerly Tracor, had used their base in other electronics areas to purchase firms that serve the computer end user market.

Still other companies, such as Boeing and most recently United Air Lines, have entered the services market as a means of turning their DP centers into profit centers.

Most of the firms entering the hardware market, including Tracor, feel they will have to reach a volume of $100 million in revenues by the end of 1975 to be able to stay in business and compete successfully.

The activity of these firms was spurred by the recession of the past 18 months, because small peripheral firms were available for purchase due to the bad economic climate – allowing the then capital rich firms to make selective purchases in the field.

During that time Tracor picked up Bright Industries, Inc., Peripherals General Inc. (PGI), and Remcom Manufacturing Co., and as recently as six months ago was still looking for acquisitions to help fill out its peripherals product line.

The goal of all of the new mini-conglomerates in this field was, and still is, to offer a complete line of peripherals, so that the end user will have to deal with only one supplier in addition to the mainframe manufacturer and the telephone company.

In its divestiture, Tracor said it will seek parties to provide sound continuing support for Bright, PGI, and Remcom.

"The time has come when Tracor is faced with the need to choose between either continuing to fund product development and equipment leasing programs for computer products or applying its total resources to the growth and development of its traditional business conducted through its sciences and systems, military products, instruments, and components groups. The financial requirements are too great to do both effectively," commented Chairman Richard N. Lane.

Tracor will continue to support all its products and those of Bright, PGI, and Remcom during this period of divestiture. Government applications involving Tracor's computer products will continue to be vigorously pursued and supported, the firm said.

Tracor has created reserves of about $17.5 million (net of tax benefits of $1.2 million that are currently usable) against its total investment in the computer products field.

This amount represents the estimated costs of supporting its products during the period of divestiture and its estimated losses on the disposal of its activities in the computer product area.

As a result of this action, ordinary and capital tax loss carryforwards of about $15 million will be available for use in the future.

Losses from the discontinued operations before interest and corporate charges, which have been charged totally against continuing operations, were $82,000 for the three months ended Sept. 30, compared with $286,000 for the same period of 1970.

Whether the Tracor move represents an end to the idea of mini-conglomerates in the independent peripherals area or just the problems of one firm is hard to determine at the present.

Most of the other firms pursuing the same path claim they are in the business to stay, no matter what, and several are doing well, according to recent financial reports.

The move may mean, however, that investors will be wary of this type of company, until it can prove it is well established in the business and here to stay.

# Afips May Establish Washington Office; Sponsors Japan Conclave

By E.J. Bride and E.D. Lundell Jr.
Of the CW Staff

LAS VEGAS – The computer community may need a man in Washington, D.C., to speak on matters important to it, Keith Uncapher, Afips president, told a press briefing at the recent Fall Joint Computer Conference here.

The wide ranging briefing covered everything from system certification to the joint USA-Japan computer conference, and the management and direction of the joint conferences themselves.

Uncapher noted that the organization has hired a consultant to advise the internal staff on future directions of the shows and said it had also decided to establish an Industry Advisory Panel to solicit industry comments on the shows [CW, Nov. 24].

The President's recent science report had no mention of computers, Uncapher said, noting that the computer community needs to present its views more forcefully in the government area.

Afips should play a larger role in determining trade regulations and the computer industry is not well represented presently in Washington, D.C., he continued.

Afips is considering opening an office in the Capitol to advise various government agencies and congressional committees on matters of importance to the industry and computer users, he added.

At present, it is too early for an organization like Afips to begin certifying systems and programs, Uncapher stated in discussing the results of a year-long study of a certification proposal.

Two workshops on the subject of system certification have been held in the last year, Uncapher reported.

The conclusions drawn from them indicate that while systems designers want some type of help, they do not feel that any organization could successfully certify that systems meet their desired goals.

Although the groups felt certification was impractical, they did call on Afips to help devise a set of preferred design practices for the development of large systems, particularly systems that affect the general public.

Uncapher said Afips would begin to get involved in systems review procedures and actions in this area would be forthcoming shortly.

### Japan Conference

The joint USA – Japan computer conference next October will view matters of importance to industry and users, and to society, as opposed to the JCC orientation towards state-of-the-art topics, Uncapher noted.

The conference, Oct. 3-5, will be sponsored jointly by Afips and the Information Processing Society of Japan, and Afips plans low-cost charter flights to encourage American participation, he stated.

The Japanese have undertaken artificial intelligence and robotics projects differently from American scientists, Uncapher noted, and an information exchange should help computer engineers from both countries.

# $1 Billion Printer Sales Seen

PALO ALTO, Calif. – Creative Strategies Inc. forecasts revenues of $1.4 billion from sales of computer printers in 1976, compared with $670 million in 1970.

Over the next five years, an average compound annual growth rate of 12.5% will keep computer printers in a dominant position over the market for other output equipment such as computer output microfilm (COM) and CRT display units, the firm said.

In the study the market for printers was divided into eight segments, including applications for three classes of computers, off-line print stations, data entry systems and three classes of terminals.

Minicomputers and CRT displays are areas in which the most rapid growth is expected, while the largest segment in terms of annual shipments comprises printers used with large and very large computers, Creative Strategies Inc. (CSI) said.

In an analysis of the nonimpact printer market, the firm estimates the value of nonimpact printers shipped in 1976 will be $75 million, growing from a base of only $6 million in 1970.

This figure represents a total printer market penetration of 5.5%, and depends on the introduction of nonimpact printers with plain paper and mutliple copy capability.

Of over 42 companies currently manufacturing printers, several are expected to abandon the business within the next two years, according to the firm.

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# As Russian Market Opens, IBM and ICL Square Off in Battle for Dominance

By Bohdan O. Szuprowicz
Special to Computerworld

VIENNA – Now that IBM has officially entered the Russian market by selling its first 360/50 there and announcing its readiness to sell 370/135 and 370/145 models, will the Russian computer user get improved service or choice of equipment in his own centrally planned environment?

Not likely. Computer preferences may be voiced and discussed by the user but availability of foreign currency and approval of the appropriate ministry come first.

In the case of Russian produced Minks, Besms and Urals allocation is still according to plan but the rub comes after the user has obtained the much wanted computer – be it Russian or western machine.

The user is up against two basic problems: service and political Soviet managers. The service problems amount to reliance on a user's own resources to keep the installation going.

In a way this helps the western manufacturer selling to the Soviet Union user, because while he is expected to provide training and documentation, he is not expected to maintain computer engineers at the larger sites.

### IBM in Vienna

IBM has been selling in Eastern European countries for several years and is already operating out of Vienna where 300 personnel are continuously training batches of programmers, analysts and computer engineers.

ICL, on the other hand, began selling in Russia in 1964 and over the years established a good working relationship with Mashpriborintorg, the trade agency involved with import of computers.

According to L.A. Jewitt, ICL's general sales manager for Europe, if price and foreign currency was not such a factor with the Russians, ICL would be shipping several hundred of its computers to Russia. This, he points out, would mean a lot to the UK computer industry.

ICL is the leader among western manufacturers in Russia with about 30 installations – some at prestigious Soviet ministries. However, IBM is the overall leader as far as installations in Eastern Europe are concerned and has already sold some machines in all countries – particularly in Yugoslavia where there are as many as 185 IBM computers.

ICL's most recent accomplishment is receipt of accreditation status from the Soviet Ministry of Foreign Trade. This extremely rare privilege permits a foreign company to establish permanent offices in Russia without having to operate out of hotel rooms with private Telex lines to its home office. ICL also can obtain regular residences for its British staff and permission to employ Russians in some of the support functions.

### IBM Invitation

On the other hand, IBM's top brass was invited to Moscow in October, 1970 by the Soviet State Committee for Science and Technology, and the Russians asked quite bluntly if there were ways to be mutually useful.

T.J. Watson, Jr., Gilbert Jones, John Opel and Nicholas Katzenbach made the trip, and Watson expressed his opposition to joint ventures anywhere in general and in particular to the manufacture of components in Russia.

It was at that time that Watson made the statement that if the Soviet Union went for imports in a big way this would create a potential market worth several 100's of millions of dollars.

So far the biggest bone of contention between IBM and ICL was Nato's Coordinating Committee (Cocom) which has to issue individual permits for every shipment going behind the iron curtain.

ICL feels that in many cases it was not necessary to hold approval of a shipment as long as it was withheld.

The strategic embargoes are irksome to ICL which feels that it has opened up the markets in Russia and Eastern Europe only to see them invaded by American competition.

As far as the Russians are concerned they are obviously much in love with the IBM 360 series and even more so with the 370s. Their own RJAD series closely follows the design concept, even including its "errors." The Russian users feel that compatibility and cost savings in development are worth the price of repeating a few weak points.

The Russian plans call for 35,000 computer installations by 1975 where today there are 7,000 at best. They also admit that at least one third will have to come from the West because their own capacity will not meet the "need."

Watson may yet be right in holding out for direct sales, and knowing the Russians may yet get IBM accredited in Russia in a hurry.


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## 3 Million Customers

# British Banks Buy Credit Card System

Special to Computerworld

LONDON – A consortium of three major banks here has purchased a computer system consisting of about 50 programs used for handling credit card transactions from an Omaha, Neb., firm.

The system was purchased from First Data Resources Inc. by the Joint Credit Card Co. Ltd., a consortium of Lloyds Bank, Ltd,; National Westminster Bank, Ltd.; and Midland Bank Ltd.

The three British banks, which have assets of over $41 billion and over 8,500 branch offices, will use the system to start a credit card operation in the UK.

First Data Resources designed the credit card processing system and handles all Master Charge transactions processing, billing and accounting for over 1,000 banks, 700,000 cardholders and 26,000 merchants in six midwestern states.

For two months, the Joint Credit Card Co. Ltd. had a task force of design technicians in the U.S. studying several credit card operations to decide whether to adopt some existing processing system or develop their own.

"We were impressed with First Data Resources management, processing innovations and the efficiency of the overall operation, both computer and clerical. And efficiency is a must when you are going to start with 3 million active credit card customers and grow from there," said Hugh Cameron, top man at Joint Credit Card Co. Ltd.

The 3 million Britishers will get their new credit cards next September. Cameron expects 6 million people to be using the new card by 1975.

"Consumer credit in general is much more limited in the UK than in the U.S.," Cameron said.

"For example, there are no oil company credit cards and only a few large department stores have their own card. But," Cameron added, "the people are ready for additional credit and that's why we are entering the picture at this time."

A name for the new card offered in the UK has not yet been chosen.

# IBMer Patents Replica Process For Holograms

ENDICOTT, N.Y. – A technique for making replicas of holograms on a large scale and at "low cost" has earned a U.S. patent for IBM.

Inventor John H. King Jr., a staff engineer at IBM's systems development laboratory here, said holoarrays containing many individual holograms can be reproduced rapidly without loss in quality, and the technique has potential application in future large capacity optical data storage systems.

In the new process, the master hologram or holoarray and the plate on which a replica is to be recorded are placed on opposite sides of a field lens at its conjugate focal planes.

A readout beam directed through the master yields a diffracted beam containing the master image that passes through the lens and interferes with a reference beam to form interference patterns on the plate.

Master holograms to be reproduced are constructed by a sideband technique using spatial filters in both the object and reference beams. A collimating lens provides a plane wave reference beam which interferes with a convergent object beam focused at the image plane.

To construct a master holoarray, the object beam is shifted to a different position for each discrete hologram to be recorded. A small aperture mask and short focal length lens behind a collimating lens provide a moveable point source of light. A second moveable mask is positioned in front of the holoarray itself.

The masks and short focal length lens move together in planes perpendicular to the beam to control the position of each hologram on the holoarray.

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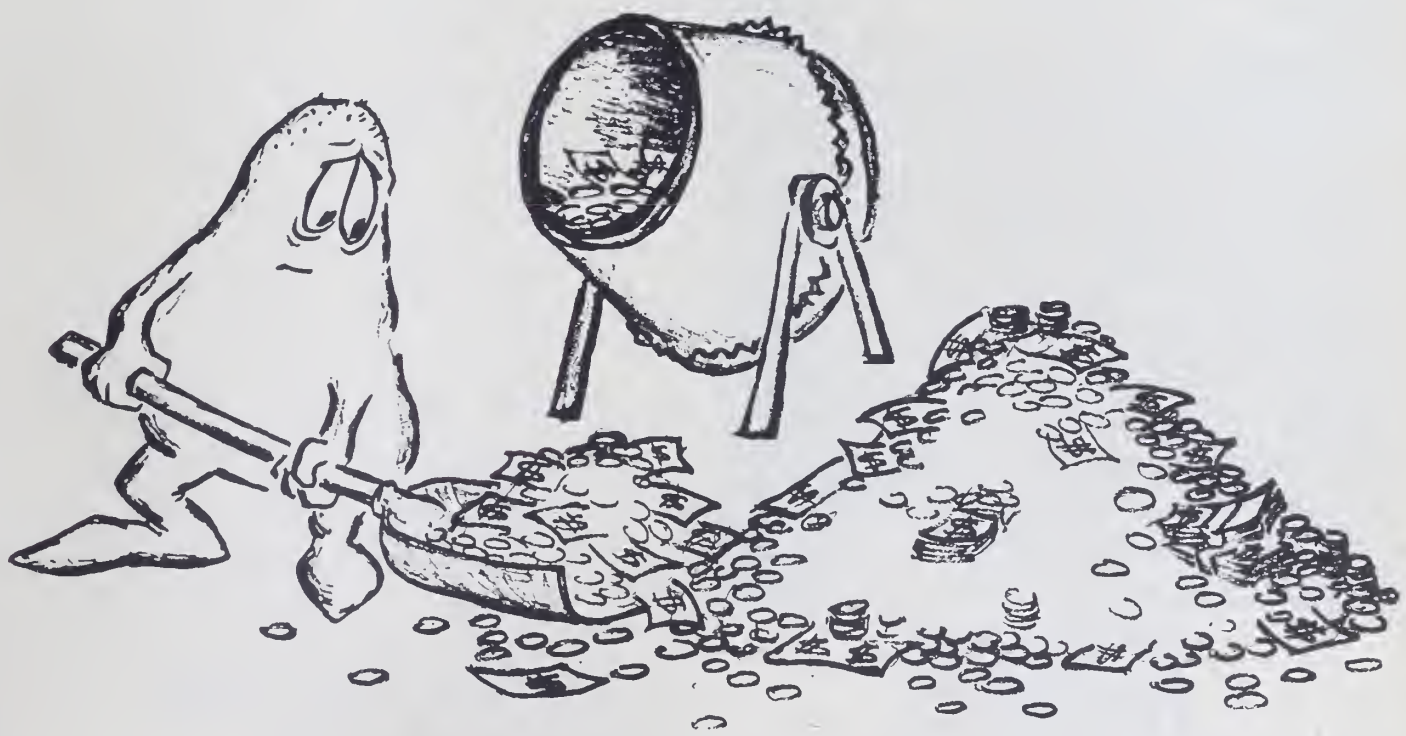

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# Ampex, Memorex Report Earnings Down

NEW YORK – Two of the big firms in the independent peripherals market, Ampex and Memorex, have reported losses for recent quarters, despite increasing sales and revenues.

Ampex sales for the second quarter ended Oct. 30 rose 11% over the prior year but resulted in a net loss of 24 cents per share.

Sales for the second quarter totaled $82.3 million, up 11% from $74.4 million in the comparable period last year. The quarter loss of $2.6 million, or 24 cents per share, is compared with earnings of $139,000, or 1 cent per share, last year.

For the first half of fiscal 1972, sales totaled $155.3 million, up 12% from $139 million last year. A loss of $3.4 million or 31 cents per share, compares with earnings of $136,000, or 1 cent per share, a year earlier.

Arthur H. Hausman, president, said he does not expect earnings in the last half to offset first half losses and the company expects a loss for the year.

Memorex had a net loss of $5.3 million on combined total revenue (Memorex and ILC) of $80.6 million for the nine months ended Sept. 30.

Combined rental revenues from equipment for lease exceeded 45% of total revenues in the third quarter.

By year-end 1971, the company projects an annual rate of combined rental revenues of about $70 million, noted President Laurence L. Spitters.

Memorex's net investment in equipment for lease at Sept. 30 approximated $100 million.

Revenues in 1971 are not comparable to results in 1970 because of the major shift to leasing of Memorex equipment products during the past 12 months, the firm claimed. Evidence of the shift is the six times increase in rental revenues in the third quarter compared with the same period a year earlier.

In the first nine months of 1970, the firm earned $3.9 million, equal to $1.03 per share, on sales of $60.5 million.

The combined loss for the nine months in 1971 was $1.35 per share. The third quarter loss was 37 cents per share, compared with 39 cents per share in the second quarter and 59 cents per share in the first quarter.

## Mohawk Sees Better Quarter

HERKIMER, N.Y. – Mohawk Data Sciences Corp. said earnings for the second quarter ended Oct. 31 "are expected" to show an improvement over both the same year-ago period and the first quarter of the present fiscal year.

At the same time reveneus are expected to reach a record high, according to R.P. Rifenburgh, president, who also announced the formation of MDS-Financial Corp., a subsidiary that will lease peripheral equipment and mainframe computers.

The quarterly results will reflect a substantial expansion in outright sales of computer peripheral equipment to end users as well as continued progress in MDS's domestic and overseas rental business, Rifenburgh said.

"The record revenues," he added, "were not significantly increased by deliveries of MDS's new System 2400 which began in late August to domestic user customers, although the operating results continued to be depressed by the expensing of engineering and marketing costs related to such systems . . . Its introduction abroad only last month has not yet benefited our overseas backlog of orders.

In announcing the formation of MDS-Financial Corp., he said: "We believe that the future growth in the independent data processing market belongs to those companies which can provide users from one source both independently manufactured peripherals and central processors of their choice."

## Acquisitions

**Diebold Computer Leasing Ltd.**, the British subsidiary of Diebold Computer Leasing, Inc., has acquired Rathmines Midland Finance Ltd. The transaction was for cash.

**Hadron, Inc.**, Westbury, N.Y., has acquired Laser Microfilming, Inc., E. Natick, Mass., in exchange for an undisclosed amount of stock. Laser Microfilming uses laser technology to compress, record and store data on microfilm.

**Data Dimensions, Inc.**, a terminal equipment lessor, has acquired four New Jersey-based DP leasing companies for an exchange of stock. The firms are the River, Bishop, Essex and Bergen Leasing Corps.

**Data Management Inc. (DMI)** and National Keypunch Services, Inc. (NKS) have merged, following the acquisition of NKS stock by DMI. NKS, specializing in the computer and microfilm input, will continue to operate as a wholly owned subsidiary until arrangements are finalized.

**Anderson Jacobson Inc. (AJ)** and Delta Data Systems, Inc. have agreed in principle to the acquisition of Delta Data by AJ for an exchange of stock. The transaction is subject to approval by Delta's shareholders.

**General Learning Corp.** has purchased Educators Consultant Services Inc. and Visual Statistics Inc. from Singer Pattern Co. for an undisclosed amount of cash. The companies provide DP and consulting services to schools.

**Trentham Corp.** has acquired the Medical Systems Division of Computer Corp. of America to expand its line of automated laboratory systems.

**Bonner & Moore Computing Co.** has acquired the business operations of Transdata Corp., a Phoenix data processing utility.

**Reynolds & Reynolds Co.** purchased Dealer-Management Analysis Corp., which provides computerized analyses of auto dealer financial statements.


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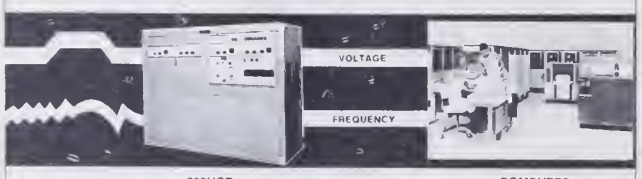


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TRADE★QUOTES®

# Computerworld Stock Trading Summary

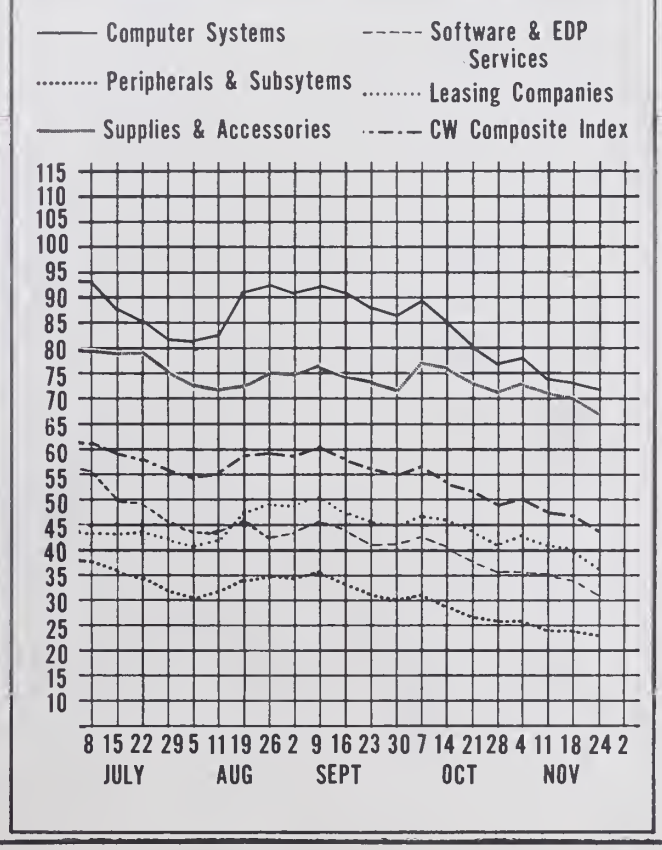
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES WEDNESDAY, NOVEMBER 24, 1971

| EXCH | | 1971 RANGE (1) | CLOSE NOV 24 1971 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|---|---|
| | **SOFTWARE & EDP SERVICES** | | | | |
| O | ADVANCED COMP TECH | 1- 4 | 1 | - 1/4 | -20.0 |
| A | APPLIED DATA RES. | 5- 13 | 4 1/2 | - 5/8 | -12.1 |
| O | APPLIED LOGIC | 1- 3 | 1/4 | - 1/8 | -33.3 |
| N | AUTOMATIC DATA PROC | 44- 66 | 57 7/8 | + 1/4 | +0.4 |
| O | AUTO SCIENCES | 1- 8 | 1/2 | - 1/4 | -33.3 |
| O | COMPUTER NETWORK | 2- 11 | 4 1/2 | - 1/2 | -10.0 |
| O | COMPUTER PROPERTY | 5- 11 | 5 | - 1/2 | -9.0 |
| N | COMPUTER SCIENCES | 6- 17 | 6 1/2 | - 3/8 | -5.4 |
| O | COMPUTER TECHNOLOGY | 4- 11 | 4 | - 1/2 | -11.1 |
| O | COMPUTER USAGE | 5- 16 | 5 1/2 | - 1/8 | -2.2 |
| O | COMP AUTOMOT REPORTS | 6- 13 | 6 3/4 | - 1/2 | -6.8 |
| N | COMPUTING & SOFTWARE | 17- 45 | 16 1/2 | -2 1/2 | -13.1 |
| O | COMRESS | 1- 4 | 1 1/4 | - 1/4 | -16.6 |
| O | COMSHARE | 4- 8 | 4 1/4 | 0 | 0.0 |
| O | DATA AUTOMATION | 1- 4 | 1/4 | - 1/4 | -50.0 |
| O | DATA PACKAGING | 6- 10 | 6 1/4 | 0 | 0.0 |
| O | DATAMATION SERVICE | 1- 3 | 1/2 | 0 | 0.0 |
| L | DATATAB | 4- 10 | 5 3/4 | - 3/8 | -6.1 |
| O | EDP RESOURCES | 5- 16 | 5 1/8 | - 1/4 | -4.6 |
| A | ELECT COMP PROG | 2- 7 | 2 1/4 | - 1/8 | -5.2 |
| N | ELECTRONIC DATA SYS. | 34- 85 | 39 3/8 | +5 3/4 | +17.1 |
| O | INFORMATICS | 6- 15 | 5 5/8 | - 3/8 | -6.2 |
| O | I.D.A. DATA CORP | 1- 3 | 7/8 | 0 | 0.0 |
| A | ITEL | 7- 23 | 6 3/4 | 0 | 0.0 |
| O | KEANE ASSOCIATES | 4- 14 | 5 | 0 | 0.0 |
| O | KEYDATA CORP | 5- 14 | 8 1/2 | 0 | 0.0 |
| A | MANAGEMENT DATA | 5- 11 | 5 1/2 | + 5/8 | +12.8 |
| O | NATIONAL CSS INC | 7- 14 | 6 1/2 | - 3/4 | -10.3 |
| O | NAT COMP ANALYSTS | 1- 4 | 1/2 | 0 | 0.0 |
| P | ON LINE SYSTEMS INC | 7- 18 | 7 3/4 | - 3/4 | -8.8 |
| N | PLANNING RESEARCH | 10- 26 | 10 3/4 | - 3/4 | -6.5 |
| O | PROGRAMMING METHODS | 16- 29 | 17 1/2 | - 1/2 | -2.7 |
| O | PROGRAMMING & SYS | 1- 4 | 1 1/4 | - 1/4 | -16.6 |
| O | SCIENTIFIC COMPUTERS | 2- 3 | 2 1/4 | - 1/4 | -10.0 |
| O | SIMPLICITY COMPUTER | 1- 4 | 3 | - 1/4 | -7.6 |
| O | SOFTWARE SYSTEMS | 1- 3 | 3/4 | - 1/8 | -14.2 |
| O | TBS COMPUTER CENTERS | 4- 9 | 4 1/4 | 0 | 0.0 |
| O | TOLLEY INTL CORP | 3- 8 | 6 3/8 | - 5/8 | -8.9 |
| O | TRACOR COMPUTING | 2- 5 | 1 3/4 | - 1/4 | -12.5 |
| O | TYMSHARE INC | 4- 15 | 6 7/8 | + 1/8 | +1.8 |
| O | UNITED DATA CENTER | 2- 7 | 4 1/4 | - 5/8 | -12.8 |
| N | UNIVERSITY COMPUTING | 14- 38 | 13 1/2 | -2 | -12.9 |
| A | URS SYSTEMS | 5- 11 | 5 1/4 | + 1/2 | +10.5 |
| O | VORTEX CORP | 2- 6 | 5 1/2 | - 1/4 | -4.3 |
| | **PERIPHERALS & SUBSYSTEMS** | | | | |
| N | ADDRESSOGRAPH-MULT | 24- 48 | 28 | - 1/2 | -1.7 |
| O | ALPHANUMERIC | 1- 6 | 7/8 | - 1/4 | -22.2 |
| N | AMPEX CORP | 12- 25 | 11 5/8 | -3 | -20.5 |
| O | ANDERSON JACOBSON | 6- 10 | 4 1/2 | -1 | -18.1 |
| O | ATLANTIC TECHNOLOGY | 3- 8 | 3 | - 1/8 | -4.0 |
| A | BOLT,BERANEK & NEW | 4- 8 | 4 1/8 | - 5/8 | -13.1 |
| N | BUNKER-RAMO | 6- 17 | 5 5/8 | - 1/2 | -8.1 |
| A | CALCOMP | 14- 33 | 14 3/8 | - 1/8 | -0.8 |
| O | COGNITRONICS | 2- 9 | 2 1/8 | - 1/8 | -5.5 |
| O | COLORADO INSTRUMENTS | 2- 8 | 1 1/2 | - 1/4 | -14.2 |
| O | COMPUTER COMMUN. | 5- 19 | 5 | - 5/8 | -11.1 |
| A | COMPUTER EQUIPMENT | 3- 7 | 2 7/8 | + 1/4 | +9.5 |
| A | COMPUTEST | 4- 20 | 4 1/2 | - 1/8 | -2.7 |
| O | CONSOL COMPUTER LTD. | 1- 12 | 1 1/4 | 0 | 0.0 |
| A | DATA PRODUCTS CORP | 3- 10 | 4 1/8 | - 1/4 | -5.7 |
| O | DATA RECOGNITION | 3- 8 | 4 | - 1/4 | -5.8 |
| O | DATA TECHNOLOGY | 3- 9 | 3 3/8 | - 3/8 | -10.0 |
| O | DIGITRONICS | 2- 8 | 3 3/8 | - 1/2 | -12.9 |
| N | ELECTRONIC M & M | 5- 16 | 5 1/4 | - 1/4 | -4.5 |
| O | FABRI-TEK | 2- 4 | 2 | - 1/8 | -5.8 |
| O | GENERAL COMPUTER SYS | 6- 10 | 6 1/4 | -1 1/4 | -16.6 |
| N | GENERAL ELECTRIC | 53-124 | 55 3/4 | -1 1/8 | -1.9 |
| O | INFOREX INC | 17- 49 | 19 3/4 | + 1/2 | +2.5 |
| O | INFORMATION DISPLAYS | 3- 8 | 4 | + 5/8 | +18.5 |
| O | MANAGEMENT ASSIST | 1- 2 | 3/4 | 0 | 0.0 |
| A | MARSHALL INDUSTRIES | 7- 27 | 7 3/8 | - 5/8 | -7.8 |
| N | MEMOREX | 20- 78 | 20 3/4 | - 3/8 | -1.7 |
| A | MILGO ELECTRONICS | 12- 26 | 11 3/4 | - 3/8 | -3.0 |
| N | MOHAWK DATA SCI | 15- 47 | 14 5/8 | 0 | 0.0 |
| O | OPTICAL SCANNING | 6- 18 | 5 3/4 | - 5/8 | -9.8 |
| O | PHOTON | 6- 12 | 6 3/8 | - 7/8 | -12.0 |
| A | POTTER INSTRUMENT | 11- 25 | 11 | -1 7/8 | -14.5 |
| O | PRECISION INST. | 7- 16 | 8 1/4 | -1 1/4 | -13.1 |
| O | RECOGNITION EQUIP | 9- 26 | 11 | -1 | -8.3 |
| O | REDCOR CORP. | 1- 9 | 1 | - 3/8 | -27.2 |
| N | SANDERS ASSOCIATES | 9- 22 | 9 | - 5/8 | -6.4 |
| O | SCAN DATA | 6- 15 | 8 3/4 | - 5/8 | -6.6 |
| O | TALLY CORP. | 7- 16 | 6 1/2 | - 1/4 | -3.7 |
| N | TELEX | 8- 22 | 8 3/8 | -1 1/8 | -11.8 |
| | **SUPPLIES & ACCESSORIES** | | | | |
| N | ADAMS-MILLIS CORP | 9- 19 | 9 1/8 | - 3/8 | -3.9 |
| O | BALTIMORE BUS FORMS | 6- 10 | 8 1/4 | - 1/2 | -5.7 |
| A | BARRY WRIGHT | 7- 13 | 7 | - 1/2 | -6.6 |
| A | DATA DOCUMENTS | 14- 29 | 15 1/4 | - 1/4 | -1.6 |
| O | DUPLEX PRODUCTS INC | 8- 11 | 10 3/4 | - 5/8 | -5.4 |
| N | ENNIS BUS. FORMS | 5- 13 | 5 3/8 | - 1/4 | -4.4 |
| O | GRAHAM MAGNETICS | 9- 35 | 14 | - 7/8 | -5.8 |
| O | GRAPHIC CONTROLS | 6- 15 | 10 1/4 | - 3/8 | -3.5 |
| N | 3M COMPANY | 96-126 | 118 | -3 1/4 | -2.6 |
| O | MOORE BUS. FORMS | 36- 42 | 37 | - 1/4 | -0.6 |
| N | NASHUA CORP | 29- 47 | 44 7/8 | - 1/8 | -0.2 |
| O | REYNOLDS & REYNOLD | 37- 63 | 55 3/4 | - 3/4 | -1.3 |
| O | STANDARD REGISTER | 14- 23 | 13 7/8 | - 1/2 | -3.4 |
| O | TAB PRODUCTS CO | 8- 17 | 14 1/2 | -1 1/4 | -7.9 |
| N | UARCO | 24- 34 | 23 1/2 | -1 | -4.0 |
| A | WABASH MAGNETICS | 5- 10 | 5 5/8 | 0 | 0.0 |
| N | WALLACE BUS FORMS | 18- 26 | 20 1/8 | - 7/8 | -4.1 |
| | **COMPUTER SYSTEMS** | | | | |
| N | BURROUGHS CORP | 105-143 | 126 1/2 | -2 3/8 | -1.8 |
| N | COLLINS RADIO | 10- 20 | 10 1/4 | 0 | 0.0 |
| N | CONTROL DATA CORP | 34- 83 | 34 | -3 1/8 | -8.4 |
| O | DATA GENERAL CORP | 19- 65 | 46 1/2 | -1 | -2.1 |
| O | DIGITAL COMP CONTROL | 4- 24 | 12 3/4 | +1 3/4 | +15.9 |
| N | DIGITAL EQUIPMENT | 53- 85 | 61 1/4 | -2 1/8 | -3.3 |
| N | ELECTRONIC ASSOC. | 5- 9 | 4 5/8 | 0 | 0.0 |
| A | ELECTRONIC ENGINEER. | 5- 10 | 6 5/8 | - 1/2 | -7.0 |
| N | FOXBORO | 25- 46 | 25 1/2 | - 1/2 | -1.9 |
| O | GENERAL AUTOMATION | 9- 26 | 14 | +1 3/4 | +14.2 |
| N | HEWLETT-PACKARD CO | 30- 46 | 39 1/4 | +1 1/8 | +2.9 |
| N | HONEYWELL INC | 83-115 | 109 | + 1/2 | +0.4 |
| N | IBM | 284-364 | 291 3/4 | -3 | -1.0 |
| O | INTERDATA INC | 6- 11 | 6 1/8 | - 7/8 | -12.5 |
| N | NCR | 25- 49 | 25 | + 3/8 | +1.5 |
| N | RCA -26- 41 | 31 1/2 | -1 | -3.0 | |
| N | RAYTHEON CO | 27- 46 | 31 | -1 | -3.1 |
| N | SPERRY RAND | 23- 38 | 25 | + 7/8 | +3.6 |
| A | SYSTEMS ENG. LABS | 7- 18 | 6 7/8 | - 5/8 | -8.3 |
| N | VARIAN ASSOCIATES | 11- 18 | 11 5/8 | - 1/8 | -1.0 |
| N | VICTOR COMPTOMETER | 12- 27 | 12 | -1 3/8 | -10.2 |
| N | WANG LABS. | 20- 50 | 32 | -1 3/4 | -5.1 |
| N | XEROX CORP | 85-121 | 106 1/2 | -2 1/4 | -2.0 |
| | **LEASING COMPANIES** | | | | |
| A | BOOTHE COMPUTER | 11- 27 | 12 | - 1/2 | -4.0 |
| O | BRESNAHAN COMP. | 2- 4 | 1 5/8 | - 1/8 | -7.1 |
| O | COMPUTER EXCHANGE | 2- 9 | 1 5/8 | - 1/2 | -23.5 |
| A | COMPUTER INVSTRS GRP | 7- 14 | 6 5/8 | -1 1/8 | -14.5 |
| N | DPF INC | 8- 19 | 8 1/8 | - 3/4 | -8.4 |
| O | DATRONIC RENTAL | 2- 4 | 2 1/2 | - 1/8 | -4.7 |
| A | DCL INC | 5- 13 | 6 5/8 | - 1/2 | -7.0 |
| A | DEARBORN-STORM | 12- 23 | 16 7/8 | -1 5/8 | -8.7 |
| A | DPA, INC. | 4- 9 | 6 1/2 | - 7/8 | -11.8 |
| A | GRANITE MGT | 7- 13 | 7 | - 3/4 | -9.6 |
| A | GREYHOUND COMPUTER | 7- 11 | 6 3/4 | - 7/8 | -11.4 |
| N | LEASCO CORP | 16- 26 | 18 5/8 | - 5/8 | -3.2 |
| O | LECTRO MGT INC | 2- 5 | 2 3/4 | - 1/2 | -15.3 |
| O | NCC INDUSTRIES | 3- 8 | 6 1/4 | 0 | 0.0 |
| A | ROCKWOOD COMPUTER | 3- 9 | 3 | - 5/8 | -17.2 |
| O | SYSTEMS CAPITAL | 3- 7 | 4 | -1 | -20.0 |
| N | U.S. LEASING | 16- 39 | 34 1/8 | - 3/8 | -1.0 |

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

## Computer Stocks Trading Index




# Earnings Reports

**UNIVERSITY COMPUTING**
Three Months Ended Sept. 30

| | 1971 | a1970 |
|---|---|---|
| Shr Ernd | $.17 | ..... |
| Revenue | 33,607,000 | $25,777,000 |
| Earnings (Loss) | 1,264,000 | (4,177,000) |
| 9 Mo Shr | .66 | ..... |
| Revenue | 100,081,000 | 81,653,000 |
| Spec Chg Earnings | ..... | b4,119,000 |
| (Loss) | 4,975,000 | (4,477,000) |

a-Restated. b-Cumulative effect on prior years of accounting change to expense software, installation and development costs, except development costs of UCC subsidiary Data Transmission Co.

**ELECTRONIC DATA SYSTEMS**
Three Months Ended Sept. 30

| | 1971 | 1970 |
|---|---|---|
| Shr Ernd | $.23 | $.18 |
| Revenue | 20,471,251 | 16,300,378 |
| Earnings | 2,748,630 | 2,113,372 |

**PLANNING RESEARCH**
Three Months Ended Sept. 30

| | 1971 | a1970 |
|---|---|---|
| Shr Ernd | $.15 | b$.17 |
| Revenue | 16,702,896 | 14,743,348 |
| Earnings | 846,423 | b969,883 |

a-Restated for discontinued operations and for pooling-of-interests subsequent to Sept. 30, 1970. b-Excludes the effect of startup costs net of related revenues of Int'l Reservations Corp., a subsidiary. Restated 1970 figures including the adjustment for Int'l Reservations Corp. would be revenues of $15,235,858 and net income of $152,083, or 3 cent a share.

**GREYHOUND COMPUTER**
Three Months Ended Sept. 30

| | 1971 | 1970 |
|---|---|---|
| Shr Ernd | $.26 | $.18 |
| Revenue | 11,771,000 | 12,395,000 |
| Earnings | 1,128,000 | 764,000 |
| 9 Mo Shr | .72 | .58 |
| Revenue | 35,444,000 | 37,160,000 |
| Earnings | 3,113,000 | 2,503,000 |

**ENERGY CONVERSION DEVICES**
Three Months Ended Sept. 30

| | 1971 | 1970 |
|---|---|---|
| Revenue | $210,842 | $146,957 |
| Loss | 765,662 | 743,182 |

**CLASCO**
Nine Months Ended Sept. 30

| | 1971 | a1970 |
|---|---|---|
| Shr Ernd | b$.03 | ..... |
| Revenue | 3,123,286 | $2,518,670 |
| Spec Item Earnings | c155,483 | d154,988 |
| (Loss) | e202,966 | (943,209) |

a-Restated to reflect year-end adjustments. b-Based on income before special credit. c-Credit; principally from sale of royalty rights and tax carryforward benefit. d-Debit, from excess space provision. e-Equal to 11 cents a share.

**COGNITRONICS**
Three Months Ended Sept. 30

| | 1971 | 1970 |
|---|---|---|
| Revenue | $695,247 | $872,762 |
| Loss | 153,169 | 81,629 |
| 9 Mo Rev | 2,319,548 | 2,729,868 |
| Loss | 451,349 | 226,147 |

**COMRESS**
Three Months Ended Sept. 30

| | 1971 | 1970 |
|---|---|---|
| Revenue | $1,164,000 | $1,105,000 |
| Earnings (Loss) | 4,000 | (98,000) |
| 9 Mo Rev | 3,924,000 | 3,594,000 |
| Spec Cred Earnings | a204,000 | ..... |
| (Loss) | 464,000 | (246,000) |

a-Gain from sale of securities.

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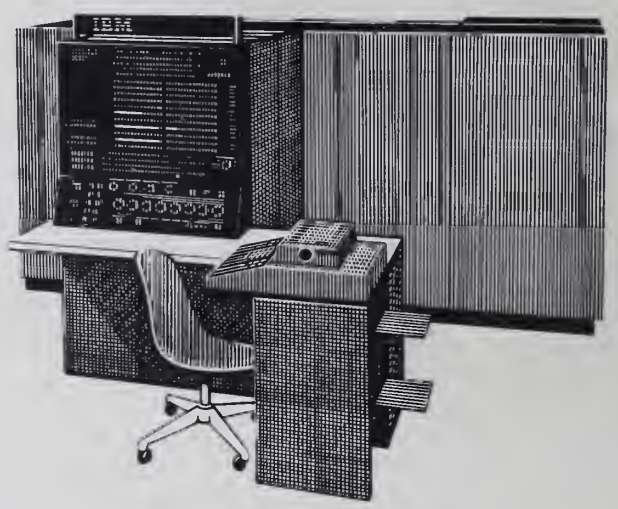
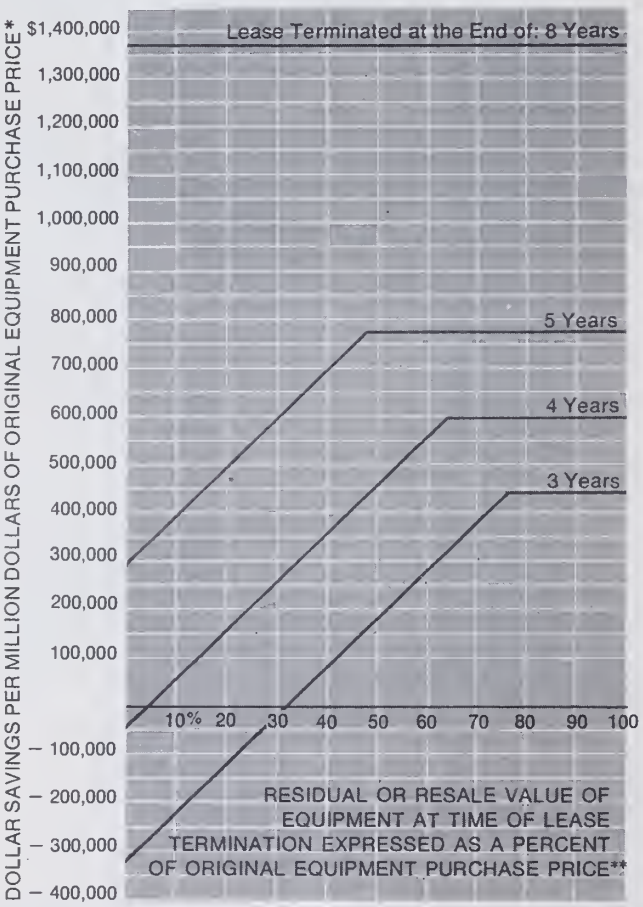


# The ITEL 370 leasing plan

COMPARING ITEL'S 370 LEASING PLAN
WITH IBM'S 370 RENTAL PLAN




*Based on 3 shifts usage, 2% personal property tax, 5% sales tax, prime shift maintenance and estimated insurance. Savings vary slightly depending upon use, configuration and individual credit and tax considerations. Savings for 6 and 7 years have been eliminated for the sake of simplicity.

**Savings depend upon resale value since termination penalties are reduced or eliminated by selling or subleasing the equipment. Maximum savings occur when the resale value of the 370 at time of termination equals the termination penalty. Minimum savings occur when the equipment is considered worthless.

As illustrated by the accompanying graph ITEL's unique new 370 Leasing Plan can save you substantial sums when compared with renting your System/370. Here are three direct comparisons between the ITEL 370 Leasing Plan and present IBM rental rates:

- Save $880,000: If an ITEL lease for a $2 million System/370 is terminated after three years, then potential savings when compared to a straight rental program can reach $880,000—in just three years!
- Save $1,200,000: The ITEL Leasing Plan for a $2 million System/370 can save you as much as $1.2 million over a four year period when compared to renting.
- Save $2,700,000: If a $2 million System/370 is retained for eight years under the ITEL Leasing Plan, savings of $2.7 million will be realized.

Consider the price you would have to pay for the 90-day "flexibility" of renting your System/370 directly from IBM. ITEL's 370 Leasing Plan provides considerable flexibility and major savings, too.

ITEL offers the largest and most qualified sales force in the computer leasing industry to serve as your agent in re-leasing or selling your System/370 when you do decide to make a change. Since ITEL's $200,000,000 System/360 portfolio is on lease in over two hundred companies across the country, finding a new home for your System/370 should not be difficult.

Whether you are planning to buy, rent or lease a System/370, or any other computer for that matter, contact ITEL—the most committed company in the computer industry.

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COMPUTER LEASING DIVISION

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New York, New York 10036
(212) 687-7630

ITEL Computer Leasing Corporation
One Embarcadero Center
San Francisco, California 94111

Please send me the facts about ITEL's System/370 leasing program. Thank you.

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COMPANY _____

ADDRESS _____

CITY & STATE _____ ZIP _____